# THE DETERMINANTS AND DETERRENTS OF PROFIT SHIFTING: EVIDENCE FROM A SAMPLE OF SOUTH AFRICAN MULTINATIONAL ENTERPRISES

by

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## DECLARATION

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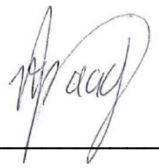
**THE DETERMINANTS AND DETERRENTS OF PROFIT SHIFTING: EVIDENCE FROM A SAMPLE OF SOUTH AFRICAN MULTINATIONAL ENTERPRISES**

I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



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## ABSTRACT

This study aimed to assess the determinants and deterrents of profit shifting, which can occur as a result of corporate income tax competition, with a view to aid in collecting sufficient tax revenue to meet public spending requirements.

The study theoretically and empirically analysed the effectiveness of the introduction of the South African transfer pricing regulations on deterring the occurrence of profit shifting in South Africa using annual financial information of South African parented multinational enterprises for the period 2010 – 2017.

The study established that the implementation of transfer pricing regulations resulted in a reduction in profit shifting that became increasingly more prominent as the rules became stricter.

Based on the findings of the study, it is recommended that the South Africa government should allocate sufficient resources to ensure that the transfer pricing regulations are being adhered with an aim to reduce profit shifting from South Africa.

## KEY TERMS

Globalisation; Tax Competition; Corporate Income Tax; Base Erosion and Profit Shifting; BEPS; Profit Shifting; Transfer Pricing; Transfer Pricing Rules; Transfer Pricing Regulations; Legislative Policy; Ordinary Least Squares; Generalised Least Squares; Seemingly Unrelated Regressions

## DEDICATION

I wish to extend my sincere appreciation and gratitude certain individuals and institutions for their contributions towards the completion of this dissertation.

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The individuals and institutions mentioned above have contributed immeasurably to the completion of this dissertation. However, any possible errors, omissions or shortcomings contained in this dissertation are the responsibility of the researcher.

TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## ABBREVIATIONS

| Description | Abbreviation |
|---|---|
| African Tax Administration Forum | ATAF |
| Base erosion and profit shifting | BEPS or profit shifting |
| Controlled foreign company | CFC |
| Corporate income tax | CIT |
| Country by country reporting | CBCR |
| Classical linear regression model | CLRM |
| Davis Tax Committee | DTC |
| Foreign Direct Investment | FDI |
| Generalised Least Squares | GLS |
| Gross domestic product | GDP |
| Income tax return no. 14 | ITR14 |
| International Monetary Fund | IMF |
| Latin America and Caribbean | LAC |
| Multinational enterprise | MNE |
| Ordinary Least Squares | OLS |
| Organisation for Economic Cooperation and Development | OECD |
| Practice Note 7 | PN 7 |
| Seemingly unrelated regression | SUR |
| South African Revenue Service | SARS |
| Value-added taxes | VAT |
| United States of America | USA or the U.S. |
| United States Dollar | USD |

# CHAPTER 1: INTRODUCTION

## 1.1. Background of the study

The Organisation for Economic Cooperation and Development (OECD) (2019) explains Base Erosion and Profit Shifting (BEPS or profit shifting) as “tax avoidance strategies that exploit gaps and mismatches in tax rules to artificially shift profits to low or no-tax locations”.

Historically, Multinational Enterprises[1] (MNEs) have made use of aggressive tax planning through profit shifting in order to minimise their overall group tax burden. One of the ways in which profit shifting is achieved is through transfer pricing[2] or, more specifically, transfer mispricing. Transfer mispricing or the manipulation of transfer prices is thought to be a key instrument in profit shifting (Liu, et al., 2017). Transfer mispricing would involve arrangements where transactions between members of an MNE group are priced at an artificial price, in order to shift income or expenses from one region to a more attractive region from the MNEs perspective (Huxham & Haupt, 2005). In general, profit shifting has occurred when the allocation of profits across an MNE Group’s subsidiaries or value chain is not reflective of the true value added by each subsidiary or by each link of the value chain – this means that the profits may not be reported in the jurisdiction where the economic activity produced it and where value was created (Reynolds & Wier, 2016).

Profit shifting as a result of transfer mispricing is an important economic topic because it manipulates and reduces the amount of profit reported in a country and the resulting tax revenues to the country are reduced as a result. Furthermore, there have been numerous cases in the media over the past few years on aggressive international tax avoidance techniques employed by large MNE’s including Google, Apple and Amazon (Riedel, et al., 2015). These cases have strengthened concerns and public debates about multinational income shifting to low tax regions. The matter of Google was particularly prominent in the media when, in 2017, one of the MNE members, Google Alphabet, reported USD23 billion in revenue in Bermuda an island tax haven which has a corporate income tax (CIT) rate of zero.

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[1] Multinational enterprises are usually large corporations, which are incorporated in one country and which produce or sell goods or services in various countries other than its home country (Doob, 2014).
[2] Transfer pricing is the general term, which refers to the pricing of cross-border, inter-company transactions between related parties.

In a critical study by Torslov et al. (2019), the researchers found that MNE's shifted more than USD650 billion in profits to tax havens in 2016. This had an overall effect on global corporate tax receipts of around 10%.

According to the researchers, what made the Torslov et al. (2019) study particularly ground breaking was that, until recently, this research was not possible. It is explained that recently, the statistical institutes of many countries have begun releasing new macroeconomic data known as "foreign affiliates' statistics". This data allows researchers to obtain an overview of where MNE's book their profits [3] (Torslov, et al., 2019).

The table below summarises the findings of the study in relation to South Africa. In this regard, it should be noted that South Africa loses 7% of its corporate tax revenues to tax havens – the specific havens are detailed below.

**Table 1: South Africa's profit shifting statistics (Torslov, et al., 2019)**

| | **Profits lost** (USD, Millions) | **Tax revenue lost** (USD, Millions) | **Tax revenue lost** (% of corp. tax revenue) |
|---|---|---|---|
| **All havens** | **4,127** | **1,155** | **7%** |
| | | | |
| EU havens | 1,716 | 480 | 3% |
| Belgium | 104 | 29 | 0% |
| Cyprus | 8 | 2 | 0% |
| Ireland | 766 | 214 | 1% |
| Luxembourg | 376 | 105 | 1% |
| Malta | 5 | 1 | 0% |
| Netherlands | 459 | 128 | 1% |
| Non-EU tax havens | 2,411 | 675 | 4% |
| Switzerland | 88 | 25 | 0% |

[3] Presumably, this information comes from the new (mostly) worldwide requirement of Country-by-country reporting.

| | | | |
|---|---|---|---|
| Bermuda, Caribbean, Puerto Rico, Hong Kong, Singapore and others | 2,322 | 650 | 4% |

Similarly, in another study conducted prior to the Torslov et al. (2019) study, Reynolds and Wier (2016), estimated that 7% of South African MNE subsidiary profits are shifted from South Africa to MNE parent companies in low tax regions. The dataset these researchers used included detailed accounts on financial information such as taxable income and net financial income, covering the period 2009-2014. According to the researchers, this research was the first attempt at quantifying profit shifting in the African context.

The BEPS problem and protection and preservation of the tax base is significantly more important for developing countries such as South Africa (UNCTAD, 2015). One of the reasons for this is because tax revenues are very meaningful in relation to these countries' revenue pool and can be easily depleted due to a lack of administrative capabilities and other socio-economic problems which developing countries may face (Johannesen, et al., 2016). According to the OECD (2014), "developing countries face difficulties in building the capacity needed to implement highly complex rules and to challenge well-advised and experienced MNEs". In addition, Reynolds and Wier (2016) and UNCTAD (2015) note that the activities of MNEs constitute a large portion of the overall activities of developing countries and a large portion of MNE's investments in developing countries comes from low tax regions.

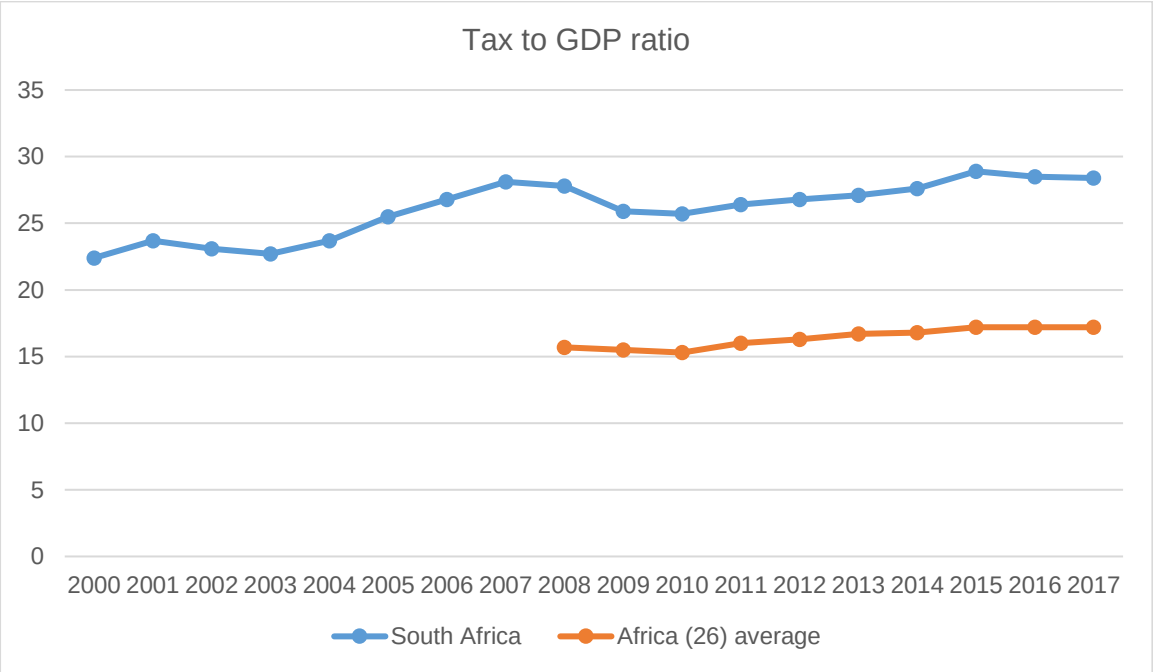
South Africa is a developing country as per the World Bank definition for high income countries as countries with gross domestic product per capita (GDP) of USD12,236 or more (World Bank, 2018). As per the International Monetary Fund (IMF) 2018 statistics, South Africa had a GDP per capita of USD6,182 for 2017 and an average GDP per capita of USD6,720 for the eight-year period 2010 - 2017.

In 2019, the OECD published a report on the revenue statistics in Africa. The report presents comprehensive data on both tax and non-tax revenues for 26 African countries (OECD/ATAF/AUC, 2019).

In South Africa, the tax-to-GDP ratio, which refers to total tax revenue as a percentage of GDP, has increased from 15.7% in 2008 to 28.4% in 2017. One way to consider the tax-

to-GDP ratio is that it provides an indication of the tax burden: a high percentage indicates that a high amount of tax is collected relative to the size of the economy (Stats SA, 2019). The statistics also show that South Africa collects a higher portion of taxes to GDP compared to an average of 26 African countries (OECD/ATAF/AUC, 2019).

**Figure 1: Tax-to-GDP ratio (OECD, 2019) (Author's compilation)**




The Africa (26) average is not available before 2008 due to missing data in some countries.

The fact that South Africa has a high tax-to-GDP ratio is an indication that South Africa relies on its tax revenues to provide public services such as building infrastructure or maintaining public goods.

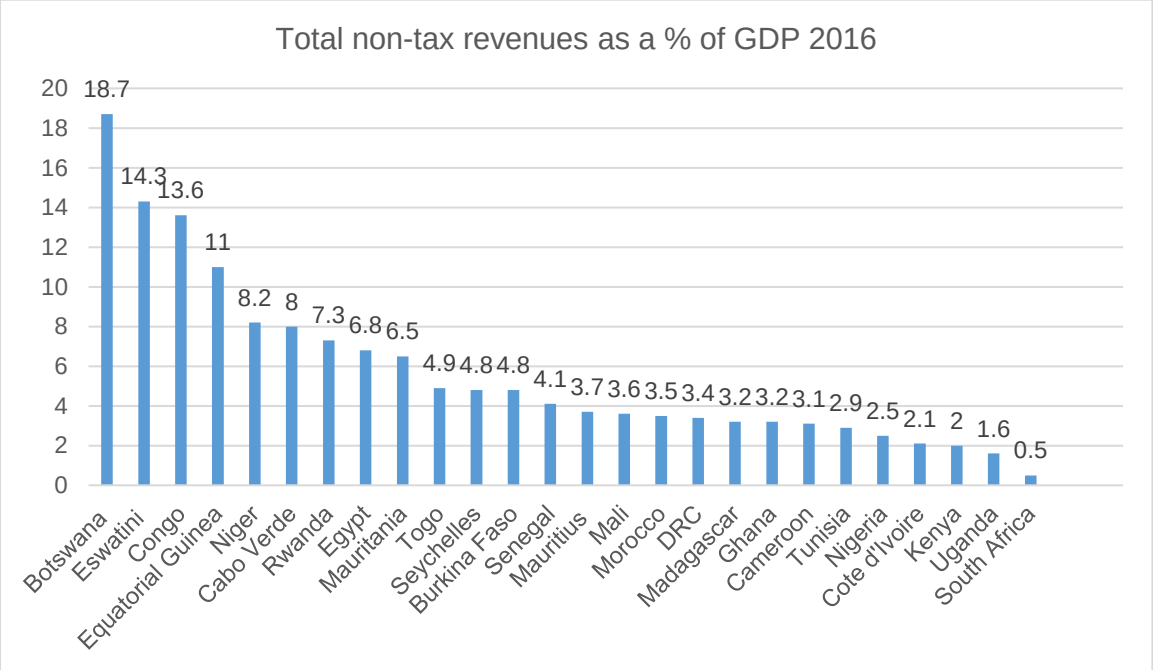
As a point of reference, the tax-to-GDP ratio of the median developing country, was 19.2% in 1996-2002 (Janbunjong, 2009). Therefore, the South African tax-to-GDP ratio is higher than the average – stressing the significance of tax revenues to the South African economic model.

Another comparison of the tax-to-GDP ratio can be made with reference to more developed countries, on the assumption that a developing country may want to transform towards tax structures which occur in developed countries since these countries typically

have tax structures that allow for greater revenue collection which have contributed to their growth. In a 2019 report, the OECD notes that the unweighted average tax-to-GDP ratio in the OECD area was 34.2% in 2017 (OECD, 2019). The OECD area is comprised of 36 countries, most of which are high-income economies and are regarded as developed economies (International Monetary Fund , 2020). In order to achieve a comparable tax-to-GDP ratio, South Africa would need to collect significantly more tax revenues. One way of doing so would be through an increase in CIT revenues brought on by protection of the CIT base.

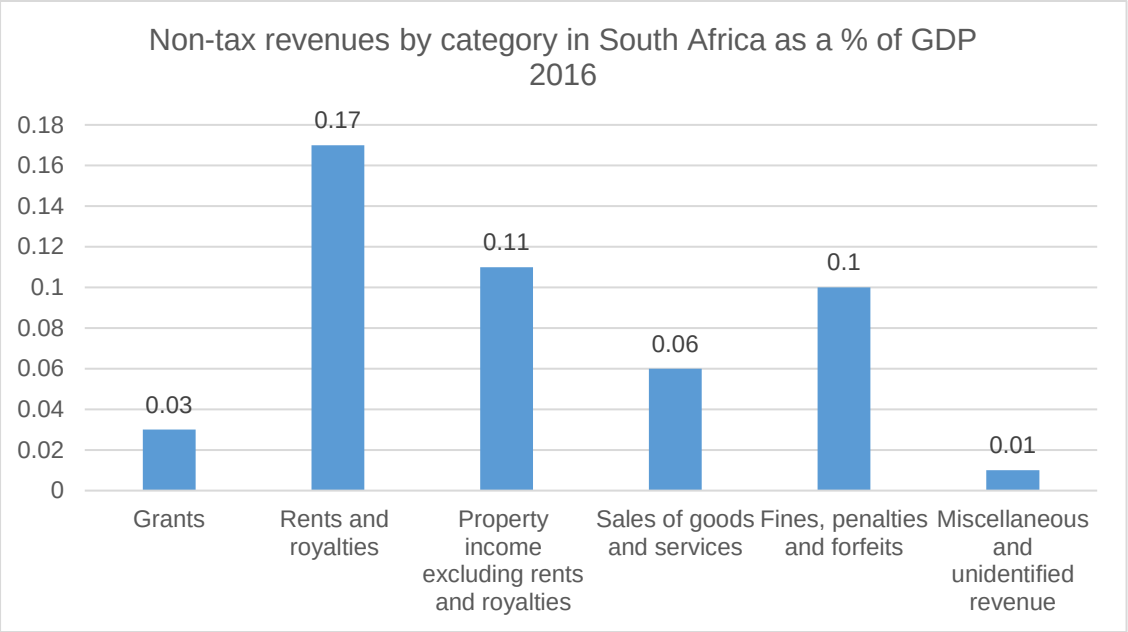
The importance of tax revenues is further amplified by the fact that South Africa's non-tax revenues amounted to only 0.5% of GDP in 2017 – far lower than tax revenues as a percentage of GDP (28.4%) in the same year. Of the 26 countries shown in the report, South Africa's non-tax revenues as a percentage of GDP was the lowest (OECD/ATAF/AUC, 2019).

**Figure 2: Non-tax revenue-to-GDP (OECD, 2019) (Author's compilation)**




The South African non-tax revenues can be categorised as per the following figure.

**Figure 3: Non-tax revenue (OECD, 2019) (Author's compilation)**




In addition, the importance of CITs is illustrated by considering the tax structure of South Africa. Tax structure refers to the split of each particular type of tax within the total tax revenue. Personal income tax accounted for the highest share of tax revenues in South Africa in 2017 (34%). Value added taxes were the second-highest contributors to tax revenues in 2017 (22%) and CITs contributed 16% of total tax revenues (OECD/ATAF/AUC, 2019). This is a higher contribution percentage compared with the African average, Latin America and Caribbean (LAC) and OECD[4] countries, which highlights the importance of CITs for South Africa specifically.

It should be noted that CITs account for a greater portion of tax revenues in South Africa than they do in developed OECD countries on average (9.3% in 2017) (OECD, 2019). However, OECD countries appear to collect far greater revenue from other sources, for example social security which accounted for 26% in 2017 versus 1% in South Africa in 2017 (OECD, 2019) and (OECD/ATAF/AUC, 2019). Therefore, it is not possible to compare South Africa's percentage contributions of CIT with that of the average OECD area.

[4] The data for OECD is for 2016 as 2017 was not available at the time of reporting.

Based on the statistics shown above, taxes and CITs are a critical source of income to South Africa. Therefore, the protection of the South African corporate tax base is of key importance to ensure that sufficient revenues are collected.

As a result of the losses experienced due to profit shifting, countries need to implement strategies which could successfully curb these profit shifting activities to maintain their respective tax bases and ensure appropriate tax revenues. One of the solutions to controlling the problem is to introduce legislative policy which targets and aims to prevent transfer mispricing, which is noted as an activity that leads to profit shifting. The introduction of explicit transfer pricing legislation is linked to the 2015 BEPS project (the BEPS reform) and specifically to Actions 8 – 10 which are aimed at aligning transfer pricing outcomes with value creation. The BEPS project came as a result of political leaders around the world identifying international tax issues as a serious concern due to the increase in the integration of national economies and markets and the concern of profit shifting arising as a result.

### 1.2. Purpose and rationale of the study

The research conducted in this study will consider the vast literature available on BEPS in order to document the determinants and deterrents of BEPS. In addition, the research will consider one of the approaches to controlling the problem, namely, the implementation of explicit and stringent transfer pricing legislation and the effect this may have on reducing transfer mispricing as a method of profit shifting with an aim to ensuring that tax authorities collect appropriate tax revenues. The research on the implementation of transfer pricing legislation will focus on South African parented MNEs with a view to determining the effect on South Africa specifically and on similar developing countries.

This is a significant topic as South Africa (a developing economy) has recently implemented explicit transfer pricing legislation relevant for South African members of MNEs[5], i.e. companies which are South African resident tax payers which belong to a MNE. The South African tax system was "source-based" prior to 2001 and was changed to "residence-based" from 2001 onwards. Source-based tax systems tax income in the

[5] South Africa has had transfer pricing legislation in place since 1995. However, this legislation was made significantly more explicit, extensive and stringent in 2016 and was effective for most companies from 2017 onward.

country in which it originates. The system is based on the premise that persons who derive income in a particular country should contribute to the cost of rendering government services in that country. Residence-based tax systems tax the income of residents of a country irrespective of which country that income is earned in, and non-residents are only subject to tax on domestic source income (South African Reserve Bank, 2015). In some cases there may be some uncertainty regarding where income originates from, which may give rise to the concept of double taxation, where the same income is taxed in multiple jurisdictions. Residence-based systems avoid the uncertainties of determining where income originates from and reduces the risk of double taxation occurring, since it reduces the chance of conflicting claims to taxable income (Pinto, 2007). Most countries in the world follow a residence-based tax system (Ernst & Young, 2019).

As explained above, it is important to consider South Africa specifically, as developing countries face particular socio-economic issues (such as administrative constraints) that may affect whether or not legislation has an impact on profit shifting.

### 1.3. Objective of the study

The purpose of this research is to survey the information available on BEPS as well as to address the gap in information relating to the effect of legislative policy (and transfer pricing legislation in particular) on the reduction of profit shifting specifically on South Africa and, consequently, developing countries. The research will consider the issue of profit shifting as well as whether the implementation of transfer pricing regulations is likely to reduce the phenomenon, and to what extent. It should be noted that the research uses financial data from the period 2010 to 2017. This time period was before the Covid-19 pandemic and the impact of the pandemic was not taken into account.

### 1.4. Research Questions

The study aims to address the following questions:

a) What are the determinants and deterrents of BEPS?
b) Does legislative policy, specifically transfer pricing legislation, have the potential to deter profit shifting?
c) Does legislative policy, which is based on policies implemented by developed countries, improve CIT collection in developing countries?

## 1.5. Hypothesis

The literature on profit shifting will show that profit shifting can have harmful effects on a country and that profit shifting through transfer mispricing is a real occurrence that has a negative effect on a country's revenue. Further, the utilisation of legislative measures through the adoption of transfer pricing regulations in South Africa will lead to a reduction in the occurrence of profit shifting by multinationals operating in the country. The tightening of the legislative measures would lead to further reductions in the occurrence of profit shifting by MNEs operating in the country. The results may also be representative of other developing countries.

That being said, developing countries also face a plethora of complex socio-economic issues such as corruption and administrative constraints that may hinder the reduction of profit shifting even where regulations are stringent. Therefore, the reduction in profit shifting due to the implementation of stringent regulations may be lower for developing countries than it is for developed countries.

## 1.6. Significance of the study

This study is significant because it has the potential to determine whether the current South African policy is an effective deterrent of profit shifting from the country in order to protect and maintain the corporate tax base in South Africa. Furthermore, given the consequences of the loss in the South African tax base, this study is aimed at encouraging further research in this area, particularly in the South African and developing country context.

The study has added to the growing literature on this topic in general and in relation to South Africa and developing countries specifically, and can be used as a basis for further research in this important field.

## 1.7. Expected contribution of the study

This research is aimed at determining the impact of policy measures taken by government on profit shifting in South Africa.

It is expected to contribute to the field of economics by determining whether policy is an effective tool in counteracting profit shifting and maintaining the South African fiscus – i.e. indicating whether the current legislative measures can effectively achieve their intended

purpose. The results could serve as a tool for government in relation to decision making on whether to proceed on the current course of action.

This dissertation could potentially also serve as an addition to the limited profit shifting and transfer pricing research available on developing countries and South Africa in particular.

### 1.8. Future developments

The study also serves as an instrument for further research. Since it is performed very close to the initial implementation of the BEPS reform, there is large scope to expand on this study and determine whether the results hold true in future. There is also scope to expand the sample dataset and consider the effects on a larger or different (perhaps non-South African) sample of companies.

### 1.9. Organisation of the study

The rest of the study contains the following:

a) Chapter Two presents the conceptual framework which underpins this study. This chapter outlines the concepts of globalisation and tax competition and also provides further details on how profit shifting affects an economy.
b) Chapter Three presents a literature review which explores the existing literature on the profit shifting phenomenon, its existence and impact on the world and the potential countermeasures which could be employed in response to this phenomenon.
c) Chapter Four provides further relevant statistics on CIT in the South African context, and goes on to present the relevant CIT and transfer pricing policies in South Africa. The chapter also presents the relevant studies performed in response to BEPS.
d) Chapter Five describes the research methodology utilised in performing the research study, including descriptions of the data collected, the method of analysis and the assumptions and expectations of the study.
e) Chapter Six presents the econometric analysis and the empirical findings for the study using the model and the methodology discussed in the previous chapter. The chapter provides an interpretation of the empirical relationship between the dependent variable and independent variables.

f) Chapter Seven presents a summary of the findings of this research. It consists of the summary of the empirical research findings in relation to the hypotheses of the study as well as recommendations for further research.

### 1.10. Conclusion

This chapter presents background information and statistics pertaining to the importance of CIT revenues in South Africa and the threat that profit shifting poses to those revenues. The chapter also specifies the main objective of conducting the research, which is to review the information available on BEPS and to address the gap in information relating to the effect of legislative policy, and transfer pricing legislation in particular, on the reduction of profit shifting specifically on South Africa and, consequently, developing countries. This chapter also explains the questions the research aims to answer, the hypotheses of this study and highlights the significance and expected contributions of the research. The conceptual framework upon which this study is based is discussed in the next chapter.

# CHAPTER 2: CONCEPTUAL FRAMEWORK

## 2.1. Introduction

This chapter provides a conceptual background to the research contained in the following chapters. The chapter outlines the concepts of globalisation and tax competition, which are the main concepts, and form the basis upon which, harmful effects including profit shifting, have emerged and continue to occur. This chapter also provides further details on how profit shifting affects an economy.

## 2.2. Globalisation

The integration of economies, or globalisation, according to Micklethwait & Wooldridge (2013), is the “freer movement of goods, services, ideas and people around the world”. Globalisation, together with the removal of barriers to trade, results in increasing numbers of companies which engage in international activities (Salvador, et al., 2012).

Globalisation leads to the expansion of markets, which aids global welfare-enhancing capital flows across international borders. This process improves welfare and living standards around the world by improving the allocation and utilisation of resources (OECD, 1998).

Globalisation has resulted in countries being required to be more transparent and accountable in the administration of their economies. Policymakers are incentivised to reform policies as a result of globalisation and countries are benefitting from the increases in international flows of capital, technology, and information. Initially, these opportunities were mostly exploited by the larger economies. However, after some time, other developing or emerging economies also sought to enter other markets besides their own and attract global flows of investments (Abed & Gupta, 2002).

Globalisation is thought to bring nations closer together. However, it has also brought about increased competition amongst governments for corporate tax bases – i.e. CIT competition (Mintz & Smart, 2001). The dismantling of international barriers can foster competition between countries. This is because it causes capital, which is a major component of tax bases, to become more sensitive to international tax rate differentials (Haupt & Peters, 2005).

There are new ways for MNE's to minimise, avoid or evade taxes due to globalisation and this phenomenon has also created opportunities for countries to develop tax policies aimed principally at redirecting mobile capital to tax efficient locations. These actions can bring about distortions in the normal trade and investment patterns and investment and can lead to reduced global welfare (OECD, 1998).

### 2.3. CIT competition

The accelerating process of globalisation and the resulting integration of national economies has led to a large increase in the potential impact that any given domestic tax policy can have on foreign economies. As highlighted in the preceding section, globalisation has also formed part of the motivation for tax reforms and has urged governments to evaluate their tax systems and public services offered on an ongoing basis with an aim to enhance the "fiscal climate" for investment (OECD, 1998). This focus on the use of tax systems to improve the fiscal climate creates the phenomenon of "tax competition".

Tax competition can be defined as "interactive tax setting by independent governments in a non-cooperative, strategic way". In order for tax competition to transpire there must be "fiscal interdependence", which occurs if tax bases tend to respond to international tax differentials. Favourable tax conditions can be introduced in a number of different ways in order to attract foreign capital, for example, through a reduction in tax burdens (Dietsch & Rixen, 2014). In other words, tax competition exists when governments use reductions in fiscal (tax) burdens to attract foreign direct investment (FDI), financial investment and critical skills by minimising the overall taxation level. The literature available on the determinants of FDI has identified that there are both policy and non-policy influences that impact and encourage FDI investment. Non-policy factors may include elements such as market size and political and economic stability. On the other hand, policy factors may include the level of regulation of the product and labour markets, CIT rates and infrastructure (Fedderke & Romm, 2004).

When higher tax rates are applied to corporate profits, this lowers FDI returns, which discourages inbound FDI to a particular region (Fedderke & Romm, 2004). It has been illustrated that OECD countries actually do compete with each other through CIT policies in order to attract investment (Devereux, et al., 2002).

The inflow of FDI is a critical contributor to economic growth and many countries have adopted incentives aimed at attracting foreign investors in an effort to accelerate their economic growth rate (Sedmihradsky & Klazar, 2002).

Tax competition can lead to the development of tax schemes that have the potential to erode national tax bases of other countries. This means that tax competition causes tax policies in one economy to have ramifications on the economies of other countries, despite the fact that improving international co-operation would likely result in advantages for all countries concerned (OECD, 1998).

### 2.4. The potential harmful effects of tax competition

Tax competition may cause harmful effects due to intentional and unintentional mismatches between different countries' tax systems. Intentional mismatches involve a country intentionally exploiting the interaction between their economy and another and their respective tax systems so as to erode the tax base of the other country. It is also possible for unintentional mismatches to exist. Unintentional mismatches may be exploited by taxpayers to the detriment of either one or both of the countries in question (OECD, 1998).

Some of the adverse effects resulting from harmful tax competition can include changing the location of investments and enabling tax avoidance and evasion. This could result in a biased apportionment of resources that may lead to an overall reduction in global welfare (Weiner & Ault, 1998).

Tax competition may lead to the propagation of harmful tax practices which have the potential for some damaging repercussions. The worst case scenario considers that tax competition leads to a "race to the bottom" where countries aim to apply extremely low or zero rated CITs (Griffith & Klemm, 2004).

Therefore, it is essential that governments employ the necessary measures to protect their tax bases in order to circumvent the overall reduction in welfare derived from illicit flows motivated by tax. The measures taken should include strengthening their international co-operation (OECD, 1998).

## 2.5. Profit shifting and the role of tax havens

It is well documented that profit shifting occurs as a result of and is driven by international tax rate differentials. Various sources exist in this regard, such as Grubert & Mutti (1991), Hines & Rice (1991), Huizinga & Laeven (2008), Egger et al. (2010), Heckemeyer & Overesch (2013), Dharmapala & Riedel (2013), and Fuest et al. (2013).

Jurisdictions with little to no taxation coupled with a low regulatory or administrative burden, and that decline to share information with other tax authorities are known as "tax havens". According to the OECD, the characteristics of a tax haven leads to a lack of "effective" taxation of income within its region (Weiner & Ault, 1998).

There is a common view that a major challenge in terms of a developing country's ability to raise required tax revenues arises from MNE firms engaging in activities aimed at shifting taxable profits out of developing countries with high tax rates towards tax havens in order to reduce their overall tax burden (Fuest & Riedel, 2010).

Overall, as a result of globalisation and tax competition, there are increased opportunities for MNE's to shift profits towards low tax jurisdictions and this has led to strategies being developed by MNEs to take advantage of this (Krautheim & Schmidt-Eisenlohr, 2009).

## 2.6. The significance of tax revenues in developing countries

The collection of tax revenues is an important factor for consideration for developing countries. Tax revenue collected from large companies is of particular importance as a source of revenue for these countries (United Nations Conference on Trade and Development, 2015). This is because the bulk of the revenue which these countries collect is from income taxes including corporate and individual taxes. Therefore, the protection of these tax bases is critical (Gcabo & Robinson, 2007).

In developing economies such as South Africa, resources are required to be put towards their most efficient social uses and a lack of resources is likely to result in unfavourable impacts on domestic resource mobilization and can also impede sustainable economic growth. Tax revenues lost by governments of developing countries would be unavailable for use by those governments toward their intended purpose of reducing inequality, eradicating poverty and improving the standard of living for the citizens of that particular country (Global Financial Integrity, 2019). The importance of tax revenues was

emphasised in the 2019 Medium Term Budget Statement which stated “in the context of weak growth … revenue shortfalls and rising spending pressures are threatening government’s ability to maintain existing levels of service provision and infrastructure investment” (National Treasury, 2019).

### 2.7. Taxation and economic growth

A study on the effect of taxes on economic growth by Helms (1985) illustrates that increases in taxes can aid economic growth assuming that increases in taxes leads to increased tax revenues, which are used by government to provide enhanced public services. Public services are highly valued by citizens and encourages overall productivity by, for example, improving infrastructure and creating knowledge through education.

Another study found that reforming tax structures from indirect to direct taxes along with aiming government spending at promoting improved standards of living, produces better effects on growth. Factors that promote improved standards of living could be social programmes and public medical schemes, amongst others (Yi & Suyono, 2014).

### 2.8. Government Spending

As explained in the preceding section, tax revenues are of particular importance as a source of revenue for developing countries and revenues are required to be available by governments for spending. Many economists acknowledge the reasoning of adopting the Keynesian approach of increased government spending (i.e., fiscal stimulus) to push an economy out of a recession. The Keynesian school of thought considers that the economy consists of consumer spending, investment, government spending and net exports. This school of thinking purports that during a recession, economic growth can be achieved through an increase in government spending. In other words, the Keynesian approach purports that increased government spending stimulates an economy (Skidelsky, 2009).

Supporters of maximising government spending assert that government spending on public programs provides valuable public goods such as education and infrastructure. These supporters also postulate that increases in government spending can support economic growth by ensuring people have more money available to them (Mitchell, 2005). In the Keynesian model, increases in government expenditure lead to the growth of the economy as a result of increased expenditure which encourages further production, income and further spending. This process results in a multiplier effect, which is a key

mechanism of Keynesian theory (Fourie & Burger, 2009). According to Keynes's theory of fiscal stimulus through government expenditure, increased government spending will lead to increased business activity and a further increase in spending. The theory asserts that spending enhances aggregate output and generates further increases in income, which, if spent could result in growth in GDP, which is greater than the initial amount of the stimulus.

### 2.9. The impact of tax evasion/corruption

Private investment and government spending are major contributors to the rate of growth and volatility of GDP (Célimène, et al., 2013). In developing countries, the public sector plays a pivotal role in economic growth and sluggishness and volatility in economic growth are often related to inefficient tax collection systems which are not able to collect the revenues required to provide the necessary public goods and services such as infrastructure and education, which are needed to stimulate productive activities (Friedman, et al., 2000).

Economists and policymakers have acknowledged for some time that institutions carry weight in determining economic performance. A view has emerged that corruption, poor governance and fragile and unstable institutions can considerably damage economic growth (Mauro, 2004). However, fighting corruption may be difficult because of the prominence of rent-seeking activities. Furthermore, building technologies that are able to detect tax evaders is an expensive task that many developing countries may not be able to afford (Célimène, et al., 2013).

### 2.10. Conclusion

This chapter provided a conceptual framework upon which the remainder of this study is based. The concept of globalisation was introduced along with the resulting phenomenon known as CIT competition. Tax competition has the potential to produce certain effects, which may be harmful to economies. One of these harmful effects includes BEPS and specifically, profit shifting towards tax havens.

BEPS is an important concept in the South African context because of the importance of tax revenues to developing countries such as South Africa – this was discussed in this chapter along with further explanatory information regarding the importance of tax

revenues stemming from the linkage between taxation and economic growth and specifically, government spending and economic growth.

Lastly, this chapter considers the significant negative impact of tax evasion and tax corruption on an economy. The next chapter explores the literature available in relation to BEPS.

# CHAPTER 3: LITERATURE REVIEW OF PROFIT SHIFTING

## 3.1 Introduction

This literature review explores the existing literature on the occurrence of BEPS. It begins with an overview of the key concepts and their existence in the real world and then provides further details on the real-world impact of these phenomena. Finally, this chapter discusses potential countermeasures which could be employed in response to these occurrences.

## 3.2 Profit Shifting and Transfer Pricing

A definition of profit shifting was provided in the preceding chapter. Another good explanation of profit shifting by MNEs is given by Hong (2010), “Multinational corporations may apply tax-planning strategies in order to shift their pre-tax profits from a high-tax country to a low-tax country; therefore, the same amount of money would be subject to a lower tax rate. By doing so, multinational corporations minimise their global tax liabilities without changing their total income.”

As explained, profit shifting can occur through the pricing of transactions between members of an MNE or “transfer pricing”. The term “transfer pricing” refers to the setting of prices of transactions, which occur between associated enterprises, which form part of an MNE group. These transactions could involve the transfer of tangible or intangible property or services between the associated enterprises (United Nations Tax Committee's Subcommittee, 2011). Transfer mispricing involves setting the price of the aforementioned transactions so as to shift profits to more attractive regions.

It should be noted that transfer pricing is normal within an MNE and entities within a group are required to transact with one another in order to run their business model successfully and benefit from value creation at different points in the value chain by different entities located in different regions including tax havens for various commercially sound reasons. An importance concept in this regard is that of “economic substance” which is achieved by performing functions, controlling assets and assuming risks in a jurisdiction (Singh & Mathur, 2017). It is completely acceptable to report high profits in a tax haven if economic substance exists in that jurisdiction. Therefore, transfer pricing in itself is not a questionable activity and the entities of many MNEs transact with one another under

acceptable terms and at appropriate prices. It is the act of transfer mispricing, or transfer pricing abuse, that is problematic because it results in profit shifting.

Over the years, transfer mispricing has been identified as one of the most common ways in which profits are shifted, according to sources such as Desai et al. (2004), Foley et al. (2006), Dischinger & Riedel (2011), Buettner et al. (2012), Karkinsky & Riedel (2012), Heckemeyer & Overesch (2013) and Dharmapala (2014).

Clausing (2000) provides a model, which explains transfer (mis)pricing on the basis that MNE's have the incentive to shift profits between countries by under-pricing goods/services sold to group entities in low-tax countries and overpricing goods/services sold by group entities in low-tax countries, and vice versa. This would result in related party trade flows to (from) low-tax country affiliates being low (high) relative to intrafirm trade flows to (from) high-tax country affiliates, ceteris paribus[6]. The model is set forth below.

The model considers an MNE, which operates in two countries that produces and sells goods/services in each country, and also exports part of the goods produced in the home country (Equation 3.1) to the offshore affiliate (Equation 3.2). The model initially assumes that the affiliate is fully owned.

Profit functions for operations in the two countries are given by the following equations:

$$\pi_1 = R_1(s_1) - C_1(s_1 + m) + pm \qquad \text{Equation 3.1}$$

$$\pi_2 = R_2(s_2) - C_2(s_2 - m) - pm \qquad \text{Equation 3.2}$$

where $\pi_1$ is profit in the home country, which depends on revenues, $R_1$, that are a function of sales, $s_1$, and costs, $C_1$, that are a function of production.

Production includes both goods sold at home and those sent to the offshore affiliate, $m$.

[6] All other things being equal

The output that is exported to the offshore affiliate is given the transfer price, $p$.

The model considers that tax rates at home are greater than tax rates abroad, $t_1 > t_2$, and deferral is allowed. $f$ represents the fraction of profits that are repatriated. Then the effective tax rate $t^e$, on income earned in the affiliate country is depicted by the following equation.

$$t_2^e = t_2 + (t_1 - t_2)f \qquad \text{Equation 3.3}$$

The net profit function for the firm's global operations is given by the following equation.

$$\pi = (1 - t_1)\pi_1 + (1 - t_2^e)\pi_2 \qquad \text{Equation 3.4}$$

To illustrate how the firm may choose a transfer price in order to maximize these net profits, the model considers the derivative of Equation 3.4 with respect to the transfer price, $p$.

$$\pi_p = (1 - t_1)m - (1 - t_2^e)m \qquad \text{Equation 3.5}$$

Substituting for $t_2^e$, using equation (3.3) and rearranging,

$$\pi_p = -(t_1 - t_2)(1 - f)m \qquad \text{Equation 3.6}$$

So, if $t_1 > t_2$, the previous expression is negative, and the firm's net profits decrease with the transfer price.

Clausing (2000), thus concludes that firms have an incentive to under-price goods sold to low-tax countries in order to shift profits to low-tax locations. Similarly, it is concluded that firms have an incentive to overprice goods sold to high-tax affiliates whenever $t_2 > t_1$, Therefore, Clausing's (2000) analysis implies that firms will want to charge the lowest transfer price possible when $t_1 > t_2$.

Due to transfer mispricing, the income earned or reported by each group entity is disproportionate to their relative economic contributions, which impacts the relevant tax jurisdictions' fair share of tax (Makola, 2003).

### 3.3 Historical occurrence of profit shifting

It has already been established that profits shifting exists. However, this is not a new discovery; profit shifting is not a recent occurrence. In fact, economic literature has, for quite some time, been providing more and more evidence that profit shifting occurs and that multinational entities deliberately set up affiliate companies in low tax regions and either transfer income to or limit expenses for these affiliate companies with an aim to reduce the group's overall tax bill (Hines, 1999).

A 2006 study of United States of America (U.S.) MNEs by Bernard, Jensen and Schott found that the prices U.S. exporting companies set for their arm's-length customers were much higher than the prices set for their related-parties (i.e. the prices to related parties were not arm's length) (Bernard , et al., 2006).

Devereux and Ma found, in their 2003 study that "differences in statutory tax rates appear to play a significant role in the location of taxable income; there is evidence that such differences affect financial policy, the repatriation of income and transfer prices" (Devereux & Ma, 2006). In addition, the 2014 study by Dhammika Dharmapala surveys the empirical literature in this regard (Dharmapala, 2014).

There have also been significant studies, which consider the magnitude of the losses faced as a result of profit shifting. The literature provides abundant evidence for the presence of profit shifting resulting from transfer pricing. According to a review of the empirical literature on international tax avoidance by MNE's, "Earlier empirical studies show that at the aggregate level, differences in the statutory corporate tax rate between the U.S. and its trading partners substantially influence the balance and pattern of intra-firm trade in the U.S. (Clausing, 2001, 2006). Later studies provide more direct evidence, showing that the price wedge between the arm's-length price for unrelated transactions and the transfer price for related-party transactions varies systematically with corporate tax rate differentials faced by MNEs in the U.S. (Clausing, 2003; Bernard et al, 2006; Flaaen, 2016), Denmark (Cristea and Nguyen, 2016), France (Davies et al., 2017),

Germany (Hebous and Johannesen, 2015), and the UK (Liu et al, 2017)", (Beer, et al., 2018).

Another study performed by Beer and Loeprick found that that profit shifting in the oil and gas sector had effects on revenue amounting to a reduction of the CIT base of between 12% up to 35% (Beer & Loeprick, 2015).

Studies also exist, which consider the issue of international tax avoidance for developing countries specifically. A 2017 study by Johannesen, Torslov, and Wier, purports that "While almost all of the empirical evidence on profit shifting concerns developed countries, the problem may be even more acute in developing countries." The study developed a new technique to detect cross-border profit shifting and took into account, certain issues that arise in the context of developing economies. The study applied the techniques to a global firm dataset (using the Bureau van Dijk Orbis Global Database) with a fair coverage in developing countries. The study showed that the tested firm's tendency to shift profits varied with economic and institutional development. Less developed countries appeared to be more exposed to profit shifting and overall tax avoidance by MNE's. The negative relationship found between a country's level of development and its exposure to MNE's international tax avoidance appeared in a wide array of empirical specifications (Johannesen, et al., 2017). The findings of the study were consistent with the wider view that developing countries have relatively lower fiscal capabilities (Besley & Persson, 2013).

In addition, the first direct evidence of profit shifting through transfer mispricing specifically in a developing country was detailed in a recent study, which used South African customs import data at a transaction level to directly test for deviations between the arm's-length prices and the actual transfer prices. The study found that South African taxpayers who engage in importing transactions with their related cross-border counterparts do so at inflated prices. Therefore, the MNE group (either South African or foreign) manipulates transfer prices so as to shift taxable profits away from South Africa and toward low-tax countries. The estimated tax loss was found to be 0.5 percent of corporate tax payments (Wier, 2018).

### 3.4 Impact on developing countries

In general, there is a common view that profit shifting poses a definite threat to developing countries' revenue collection ability. Developing countries have been more prone to profit shifting due to their lack of sufficient and effective legislative and administrative resources (Riedel & Fuest, 2010) and (OECD, 2014). A study by Beer and Loeprick in 2015 also found that "less developed economies are more vulnerable to profit shifting" in the oil and gas sector (Beer & Loeprick, 2015).

The increased occurrence of MNEs using complex structures and transfer mispricing to avoid tax in certain jurisdictions has led to losses in tax revenues for affected countries and that has resulted in economic challenges for developing countries, which suffer from resource constraints (Munyadziwa, et al., 2017).

From a South African perspective, the economic conditions mean that there is a dire need for resources and revenues and the South African Revenue Service (SARS) has become increasingly concerned about the topic of BEPS and transfer pricing.

### 3.5 Estimated losses due to illicit flows (including profit shifting)

At the time of finalizing the BEPS reports, estimates indicated that global CIT revenue net losses were between USD 200 to USD 240 Billion per year. These losses were thought to be due to a number of causes including aggressive tax planning by some MNE Groups, lack of transparency and coordination between tax administration and limited country enforcement resources and harmful tax practices (OECD, 2015). Furthermore, estimates of the impact of BEPS on developing countries, as a percentage of tax revenues, were higher than in developed countries due to the fact that developing countries place high greater reliance on CIT revenues than developed countries. As a result, according to the OECD, the continuance of profit shifting and the harmful activities that lead to it would have a disproportionately harmful impact on developing countries. Apart from the reliance on corporate tax revenues, less-developed countries suffer more significant tax revenue losses due to transfer pricing abuses owing to the lack of sufficient administrative capacity to detect such abuses in these countries (Irish, 1986).

Baker (2005) also stated that "illicit offshore transfers damage poorer countries, regardless of any other economic factors". This is due to specific circumstances of poorer countries, including insufficient growth and high levels of poverty and resource

requirements. The resource needs of African countries for social services, infrastructure and investment underpin the importance of curbing illicit financial flows from Africa (High Level Panel on Illicit Financial Flows, 2016).

The losses due to illicit flows as a result of transfer mispricing have been analysed for many years. Kar and Cartwright-Smith (2008) conducted a study to estimate the volume of illicit financial flows and associated trends from developing countries. Through a process of testing various combinations of models and by using a filter to eliminate ambiguous data, the study found that illicit financial flows are growing in volume on a yearly basis based on estimates of the period 2002 through 2006 (Kar & Cartwright-Smith, 2008).

Baker (2005) divides illicit financial flows into three main categories: “(i) commercial tax evasion, trade mis-invoicing and abusive transfer pricing, (ii) criminal activities, including the drug trade, human trafficking, illegal arms dealing and smuggling of contraband; and (iii) bribery and theft by corrupt government officials”. An estimate by Baker (2005) found that commercial illicit flows constituted the largest illicit flows with abusive transfer pricing accounting for half of the commercial estimate.

In 2010, Dev Kar and Devon Cartwright-Smith conducted another study, which examined Africa in particular and the 39 year period from 1970 to 2008. The study utilized economic models including the World Bank Residual Method and IMF Direction of Trade Statistics and estimated that illicit financial flows from Africa to the rest of the world totalled USD854 billion across the 39 year period and USD1.8 trillion when adjustments are made to take into account additional components (Kar & Cartwright-Smith, 2010). According to a report prepared by the High Level Panel on Illicit Financial Flows, this sum is approximately equivalent to the entire official development assistance received by Africa during that time. The report goes on to explain that Africa is estimated to be losing more than USD50 billion annually in illicit financial flows and these figures may be underestimated since accurate data does not exist for all African countries, and the estimates may likely exclude certain forms of non-disclosed flows due to illegal activities (High Level Panel on Illicit Financial Flows, 2016).

A very recent study by Global Financial Integrity highlighted the point that trade-related illicit flows appeared to be a persistent feature of trade between developing countries and

advanced economies. Additionally, “trade mis-invoicing” was identified as the primary means for illicitly shifting funds and this remains an obstacle to achieving sustainable and equitable growth in the developing world (Global Financial Integrity, 2019). The report explained that “trade mis-invoicing” is accomplished by misstating the value or volume of an export or import on a customs invoice. The misstating of the value of the invoice is an example of transfer mispricing. The study only covered the mis-invoicing of goods trade and did not include any estimates on services trade due to a lack of data. However, the provision and receipt of services is a fast-growing and increasingly significant component of intra group activities and world trade. Therefore, Global Financial Integrity believes the estimates of illicit flows in its report may be understated. The study highlighted results using two different datasets, namely, (1) the Direction of Trade Statistics dataset from the IMF and (2) the Comtrade dataset from the United Nations. Using the former, illicit flows for South Africa were found to be USD10.2 billion and using the latter USD5.9 billion for the ten year period 2006 through 2015. Although each dataset presented quote different final outcomes, the results are significant for South Africa in either case.

### 3.6 OECD Countermeasures

In order to counter transfer mispricing and resultant profit shifting, the OECD prepared the original version of a report entitled *Transfer Pricing and Multinational Enterprises* in 1979 (OECD, 1979). This report set forth certain guidelines, which MNEs should follow in order to ensure that their pricing activities did not bring about BEPS. The original version of the report was approved by the Committee on Fiscal Affairs on 27 June 1995 and by the OECD Council for publication on 13 July 1995. These guidelines have been revised numerous times since their initial preparation, the latest update being finalised during July 2017 (OECD, 2017).

The latest update of the OECD Guidelines was done following the finalisation of the majority of the BEPS project which started in 2013. The BEPS project came as a result of the identification of international tax issues by political leaders around the world as a serious concern due to the increase in the integration of national economies and markets. According to Cristea & Nguyen (2016), “concerns over tax avoidance have intensified so much in recent years that international taxation regulation has become a top priority on the agenda of the OECD and G8 country meetings”. The rationale behind the BEPS project was that the integration had strained the existing international tax framework and the existing rules had revealed flaws that allow for profit shifting (OECD, 2015). In addition,

there is also more awareness around international tax competition and the potential effects this may have on countries (Crivelli, et al., 2015).

Most of the BEPS reports were finalised in 2015 and 2016. However, some are still being considered in the current context, for example the report dealing with taxation in the digital economy (Herve & Starkov, 2019). The reports included new or revised standards and measures to help countries tackle BEPS due to the increased awareness around and seemingly intensifying nature of the BEPS problem. The 13 reports include 15 actions, which aim to equip governments with domestic and international tools, which can be used to tackle tax avoidance and ensure that profits are taxed in the location where the economic activities that generated these profits were performed and where value was created (OECD, 2018). The action plan also includes specific actions (11 through 13), which are aimed at enhancing the disclosure of tax-related information. Action 13 particularly addresses the issue of transfer pricing documentation. In addition, actions 8 through 10 focus specifically on transfer pricing. The OECD website states “Actions 8 – 10 contain transfer pricing guidance to assure that transfer pricing outcomes are in line with value creation in relation to intangibles, including hard-to-value ones, to risks and capital, and to other high-risk transactions.” Actions 8 – 10 are aimed at aligning transfer pricing outcomes with value creation.

Economic and value creating activities are those that drive a business and generate profits. The BEPS actions were developed on the basis that profits should be achieved (and taxed) where these activities occur. On the other hand, where there are no economic and value creating activities taking place, profits should be limited (in comparison to the former scenario). This is due to the fact that the tactic MNE’s often use is to report high profits in low tax jurisdictions in order to minimise their tax burden even though there are no significant business activities in that country and report low profits in high tax jurisdictions where there are significant ongoing business activities and value is being created. This method of shifting profits means that tax revenue is not reported in the jurisdiction where resources are used to create value, which should be the case.

The finalised action points have been implemented through their integration into the OECD guidelines as well as through specific legislation being passed in certain countries based on the action points. The core aspect of the OECD guidelines is the separate entity approach, which has been viewed by OECD member countries as the most reasonable

way in which to approach transfer pricing since it is thought to result in equitable results for the MNE (reducing double taxation) and for the country's tax administration (reducing profit shifting). The OECD Guidelines aim to balance the interests of taxpayers (MNEs) and tax administrations (OECD, 2017).

The fundamental principle embodied by the OECD Guidelines is the Arm's length principle, which stipulates that the transactions between MNE group members should be conducted under similar terms, conditions and prices as would have been agreed upon had the group members been independent parties. The arm's length principle is underpinned by the concept of transactions occurring as they would on the open market. Therefore, the principle is, primarily, an economic concept (Herve & Starkov, 2019).

Article 9 of the OECD Model Tax Conventions states: "[When] conditions are made or imposed between ... two [associated] enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have accrued to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly" (OECD , 2003).

The OECD states the following on the arm's length principle: "the arm's length principle follows the approach of treating the members of an MNE group as operating as separate entities rather than as inseparable parts of a single unified business. Because the separate entity approach treats the members of an MNE group as if they were independent entities, attention is focused on the nature of the transactions between those members and on whether the conditions thereof differ from the conditions that would be obtained in comparable uncontrolled transactions" (OECD, 2017).

### 3.7 The need for further countermeasures

Although the OECD Guidelines were put in place and the BEPS reports released, the OECD is not a law-making body and the guidelines did not have the status of law. Neither national tax administrations nor taxpayers are bound by the OECD Guidelines. The guidelines can be viewed as "soft law" (Max Planck Institute for Tax Law and Public Finance, 2012). The term "soft law" in the international taxation context can be used to describe a "quasi-legal instrument", which is not legally binding, but is intended to directly influence certain practices (Christians, 2007). However, since there is no international law

that requires any two countries to enter into bilateral tax treaties with one another or cooperate regarding which country should receive the tax income, the OECD guidelines are of utmost importance in bridging that gap and providing practical guidance. However, even though the Guidelines are thought to be quite powerful, they need to be translated into “hard law” through domestic legislation, or tax treaties, in order to produce the desired effects (Max Planck Institute for Tax Law and Public Finance, 2012).

Therefore, although the BEPS project had a massive impact on BEPS, an increasing number of governments are introducing and increasing transfer pricing regulations in order to convert “soft law” to “hard law” in order to curb profit shifting (Lohse, et al., 2012).

### 3.8 The need for policy as a countermeasure

In CESIFO Working Paper No.4975, a model is constructed to determine how an MNE will behave given different types of government action. It is found that, based on the model, a government increase in efforts to detect transfer mispricing has an unclear effect on profit shifting. On the other hand, improving and extending transfer pricing regulations (e.g. by making transfer pricing documentation a compliance requirement), results in a reduction in profit shifting (Nielsen, et al., 2014). Furthermore, according to Heckemeyer & Overesch (2013), policy makers need to restrict transfer mispricing if they want to be effective in restricting profit shifting activities. Global Financial Integrity also advised that governments and international organizations strengthen policy and increase cooperation to combat illicit flows (Global Financial Integrity, 2019).

Baker (2005) also explains that the answer to reducing abusive transfer pricing is simply that honesty is required in pricing. This appears to translate into a need for transparency in pricing, which can be achieved through the implementation of transfer pricing documentation as a compliance requirement.

### 3.9 Tax administration

Developing countries need to have sound tax administrations in place in order to benefit from globalisation or to recover from or prevent damages to their fiscus. A sound and stable tax administration is needed so as to mobilise adequate fiscal revenues (Bird, 2014). However, improving tax administration capabilities in developing countries remains a major concern.

According to Bird (2014), the revenue production process requires a particular set of resources including properly skilled and trained staff, sufficient infrastructure and equipment, and proficient managerial input. However, these particular resources are considered scarce in many developing countries including South Africa.

Operating the complex tax revenue production process effectively in a complex environment poses some difficulties. There are three key aspects, which are considered vital for effective tax administration in a country – these are, the political will to implement the tax system effectively, a clear strategy regarding how to implement the tax system, and adequate resources in order to complete the implementation. Even the most well designed tax system that is simple and appropriate for a particular country will only work if these three conditions are met (Bird & de Jantscher, 1992).

It should be noted that while a large focus is placed on the resources issue, a sound implementation strategy is required in order to mobilise these resources. Furthermore, even the soundest strategy cannot be effectively implemented in the absence of sufficient political support. It is key that in order to have an effective tax administration, the administration must clearly recognise the importance of the task and the highest authorities must be willing to support good administrative practices (Bird, 2014).

Once the key aspect of political support is achieved, the resources can be considered. The tax administration should be adequately staffed with trained officials; it should be properly organised and should be well equipped with the appropriate technology so as to assist in the gathering, storage and application of useful and necessary information, in order to make administering taxes an efficient process. It is necessary to find the appropriate mix of resources in order for the tax administration to be effective. Overall, well-trained people, with adequate political support, are needed to manage and effect a tax system (Bird, 2014).

### 3.10 Conclusion

This chapter provided further insight into the BEPS phenomenon and explained that one of the major ways in which BEPS occurs is through transfer pricing – i.e. the way in which transactions between members of an MNE group are priced.

In terms of exploring the occurrence of BEPS and transfer pricing, this chapter considered literature that provides evidence that profit shifting, and profit shifting through transfer pricing specifically, is a real-life observed occurrence.

Furthermore, the impact on developing countries was considered specifically, as this provides meaningful implications in the South African context. In addition, literature evidencing the magnitude of illicit flows was explored so as to depict the enormity of the problem in real monetary terms.

Finally, this chapter considered possible countermeasures for BEPS as well as why these are necessary and important. Policy as a countermeasure was considered specifically, as well as the importance of the tax administration whenever policy is concerned.

The next chapter provides further statistical information on CIT in South Africa and describes the relevant CIT and transfer pricing policies that exist in South Africa.

# CHAPTER 4: CORPORATE INCOME TAX POLICY IN SOUTH AFRICA

## 4.1. Introduction

This chapter starts by summarising the effects of globalisation explained in previous sections before providing further details on relevant tax statistics and highlighting the importance of CIT revenues in the South African context. The chapter then goes on to describe the relevant CIT and transfer pricing policies that exist in South Africa, which aims to address the issue of BEPS. Finally, the chapter contains references to the relevant studies, which have been performed by other researchers, which sought to consider the impact of policy on BEPS.

## 4.2. The effect of globalisation

As explained in prior sections, globalisation is thought to be a significant contributing factor to intensification of profit shifting (Liu, et al., 2017). However, globalisation is also required for developing countries to grow as it is seen as a significant contributor to FDI in developing countries (Worasinchai & Bechina, 2010). MNEs are thought to contribute to economic growth and overall wellbeing in developing countries as they assist in job creation and, as a result, provide increased buying power to the residents of that country. This leads to “increased tax revenue, increased exports, improved infrastructure and significant technological advancements” (Worasinchai & Bechina, 2010). Therefore, developing countries are inclined to safeguard their tax bases while still ensuring that FDI into their countries are not discouraged or prevented (Silberztein, 2009).

## 4.3. Tax revenue statistics

As explained in preceding sections, tax revenues are an important source of income for all countries and developing countries specifically.

### 4.3.1. Tax-to-GDP ratio

As explained in Chapter 1, the OECD published a report on the revenue statistics in Africa in 2018. The report showed that South Africa had a high and increasing tax-to-GDP ratio, which is an indication that South Africa relies on its tax revenues to provide public services.

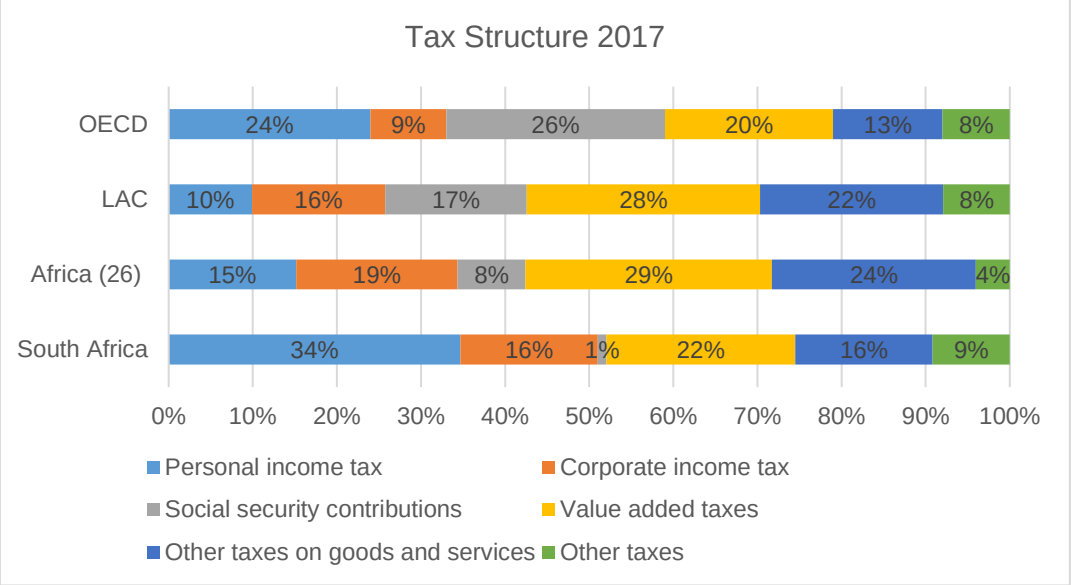
However, it is worth noting, that the interpretation of the tax-to-GDP ratio needs to be considered on a case by case basis. For example, a nation with a high ratio, where

taxpayers receive many public services would not be considered in a negative light – in this case a high tax burden is unlikely to be harmful. Many countries such as Denmark, Sweden and Finland have high tax-to-GDP ratios, but also report some of the highest standards of living in the world due to the public services they receive. In contrast, a very low tax-to-GDP ratio could be indicative of an unproductive tax system. If a government is not able to collect taxes when possible, it will not have the revenue required to provide public goods, services and infrastructure (Stats SA, 2019).

### 4.3.2. Tax Structure

South Africa's tax structure compared with that of other regions is shown below.

**Figure 4: South African tax revenue structure 2017 (OECD, 2019) (Author's compilation)**

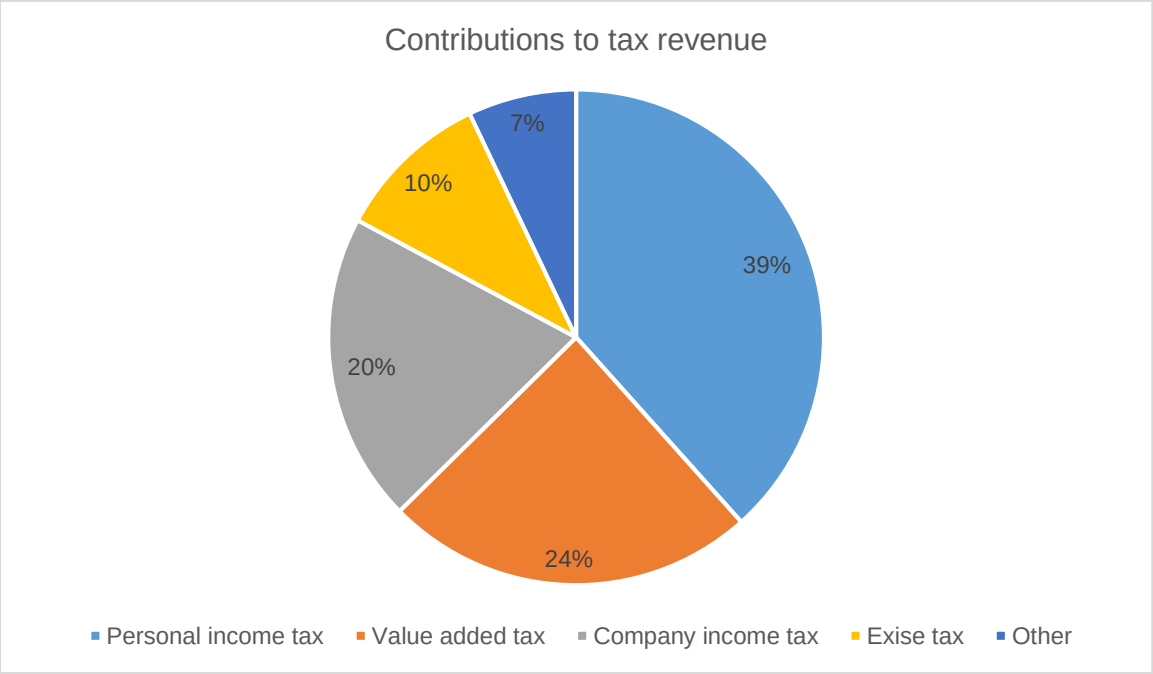



Another dataset published by Stats SA's financial statistics of national government report shows that personal income tax contributed over a third of the R1.22 trillion in taxes collected by national government in the 2017/18 fiscal year[7].

Personal income taxes were the largest contributor to tax revenues, value added tax (VAT), the second and CIT followed next and was the third largest contributor to tax revenues in South Africa.

[7] The percentages unaccounted for in the figure are due to rounding differences.

**Figure 5: Contributions of different tax types to the total South African tax revenue for 2018 (Stats SA, 2019) (Author's compilation)**




According to Stats SA (2019), tax revenue has been growing steadily, despite weak economic growth.

### 4.4. South Africa's transfer pricing legislative landscape

Governments cannot develop a tax system and rely solely on taxpayers' sense of duty to follow the system. Therefore, following a tax system is required to be the legal responsibility of residents, with penalties resulting from noncompliance in order to ensure compliance (Slemrod, 2007).

South Africa, although not a member OECD country, has followed the OECD Guidelines since the introduction of SARS Practice Note: No. 7 – 6 August 1999 (PN 7), paragraph 3.2.1. In addition, the concept of transfer pricing is considered under South African tax legislation under Section 31 of the Income Tax Act No. 58 of 1962 (the Income Tax Act).

Section 31 of the Income Tax Act states that "tax payable in respect of international transactions to be based on arm's length principle". Section 31 was introduced into the Act in 1995 (South African Revenue Services, 1999). When transfer prices do not adhere to this principle, transfer mispricing occurs.

While South Africa has had transfer pricing legislation in place for some time in terms of the above, a critical change in the landscape occurred with effect from 1 April 2012. Effectively, the scope of transfer pricing was broadened to include the principle that not only should the price of the transaction be arm's length but the overall arrangement including its terms and conditions should also follow the arm's length principle.

Furthermore, the onus of proof has also been shifted from the commissioner to the taxpayer. This means that the commissioner no longer has to prove that a transaction is not arm's length, rather the taxpayer is obliged to demonstrate that a transaction is arm's length. In addition, where transfer pricing adjustments are required, a taxpayer must make any transfer pricing adjustments that might be required by itself when it calculates its taxable income (Davis Tax Committee, 2016)

In 2013, the South African Minister of Finance established the Davis Tax Committee (DTC). The committee's aim was to inquire into the role of the tax system in encouraging inclusive economic growth, employment creation, development and fiscal sustainability (South African Government , 2019). One of the key focus areas for the DTC was BEPS and the DTC issued two reports in this regard in which recommendations were provided in relation to the BEPS action points (amongst other things). Part of the recommendations provided included guidance on the designing of tax rules to prevent BEPS. According to their report, such rules comply with the principles of a good tax system which are: equity, efficiency, certainty and simplicity (Davis Tax Committee, 2016).

Following the release of the BEPS final reports and the setup of the DTC, the legislation was extended during 2016 and 2017 through the following releases in order to legally implement the BEPS action points in South Africa (South African Revenue Services, 2018):

a. SARS Notice: Duty to keep the records, books of account or documents in terms of Section 29 of the Tax Administration Act, 2011 – 28 October 2016
b. SARS Notice: REGULATIONS FOR PURPOSES OF PARAGRAPH (b) OF THE DEFINITION OF "INTERNATIONAL TAX STANDARD" IN SECTION 1 OF THE TAX ADMINISTRATION ACT, 2011 (ACT NO. 28 OF 2011), PROMULGATED UNDER SECTION 257 OF THE ACT, SPECIFYING THE CHANGES TO THE

COUNTRY BY- COUNTRY REPORTING STANDARD FOR MULTINATIONAL ENTERPRISES – 23 December 2016

c. SARS Notice: RETURN TO BE SUBMITTED BY PERSONS IN TERMS OF SECTION 25 OF THE TAX ADMINISTRATION ACT, 2011 (ACT NO. 28 OF 2011) – 20 October 2017
d. SARS External Business Requirements Specification: Country- by- Country and Financial Data Reporting - 2017

The notices above have effectively implemented BEPS Action Plan 13, through the implementation of the three-tiered approach to transfer pricing documentation. South African taxpayers who form part of an MNE and who meet certain thresholds are required to prepare and submit the following documents:

a. A Country by Country Report (CbCR): this report summarises certain key financial and commercial information of the entire group by country. Therefore, SARS is able to have an overall view of the profits reported and tax paid in every country in relation to the activity in the country. This report is thought to serve the purpose of detecting abusive tax arrangements.
b. The Master File: this document is a summary of the operations and transfer pricing policies in place within the entire group. The master file is required to contain specific information such as the group's organisational structure, a written description of the multinational's business, a description of the multinational's intangibles, a description of the multinational's intercompany financing activities and a summary of the multinational's financial and tax positions. It is essentially, a blueprint of the Group's business and would provide further detail on what was shown numerically in the CbCR.
c. The Local File: this is a detailed transfer pricing report for the South African entity, which explains, in detail, what the transfer pricing policies are per inter-company transaction and whether the policies were applied correctly. The document also contains extremely detailed analyses explaining whether/why these policies are arm's length. This document would be read with the master file in order to see how the detailed entity information fits in with the wider group.
d. In addition to the above, a South African taxpayer meeting certain thresholds is also now required to keep significant additional records to support its related party transactions and is required to submit this information immediately if requested by SARS.

e. Lastly, the South African Income Tax Return for companies (ITR14) was amended on a few occasions to include additional specific transfer pricing and CbCR questions to be answered annually.

The steps taken above to make transfer pricing documentation a matter of compliance, aim to create transparency of MNE's activities and should highlight to tax authorities instances where MNE's report taxable profits that are inconsistent with the economic value created in a particular country. It should be noted that the rules above were effective for some South African companies from 2016; however, for most South African companies, the rules became effective in 2017. The extensive legislation that has been introduced is in line with the legislation in effect in many developed countries (Reynolds & Wier, 2016).

The improvement of transfer pricing legislation is thought to be the answer to curbing the profit shifting issue. According to Evers et al. (2016), "since current tax planning activities are mainly based on the legal exploitation of gaps and loopholes in national and international tax law…. tax legislators should limit profit shifting by enforcing tax rules and by closing gaps in tax law. In particular (through) more tightened and standardized transfer pricing regulations and thin-cap rules (which should) be adopted…". Dharmapala (2014) also purported that legal and economic policy are required as constraints for BEPS.

However, despite the extensive literature available on profit shifting and its reach and magnitude, there have only been a few studies performed in order to consider the impact of policy on profit shifting.

A study that considered policy was performed by Rathke in 2015. The analysis shows that domestic taxation of foreign profits could potentially reduce the incentive for transfer mispricing (through controlled foreign company (CFC) rules). Although broadly applied, the limited tax credit rule (when tax credits for foreign taxes paid abroad are allowed in the home country, but are limited to the home taxation of foreign profits) could also reduce mispricing incentive but less efficiently than other residence-based rules analysed. Ad valorem (proportionate) tariffs on imports may also lead to reduced manipulation. Their model provided insight into the influences of tax enforcement and market parameters on the transfer pricing incentive. The model found that tax enforcement (use of policy) was a viable method for discouraging transfer mispricing. The findings also suggested that governments may have difficulty in challenging transfer prices if market values were highly

volatile or if market activity does not provide an accurate view of an accepted arm's length price range (Rathke , 2015).

Another study performed by Beer and Loeprick confirmed earlier findings on the contribution of legislative transfer pricing documentation requirements in countering international transfer-mispricing (Beer & Loeprick, 2015).

The most important study identified is a study conducted by Riedel et al (2015). This study is entitled "Do Transfer Pricing Laws Limit International Income Shifting? Evidence from European Multinationals". The study empirically investigates whether transfer pricing laws actually restrict profit shifting behaviour. In line with previous studies, the study found additional evidence for tax-driven profit shifting and further suggested that transfer pricing regulations decrease profit shifting activities. The results of the study are economically relevant since they suggest that the adoption of transfer pricing regulations results in a positive economic effect notwithstanding the high administrative burden the regulations impose on firms and tax authorities (Riedel, et al., 2015). The results of the study show that profit shifting has declined rather than grown during the sample period 1999-2009, which is consistent with the expectation that the introduction and implementation of transfer pricing rules in the sample countries has reduced profit shifting (Dharmapala, 2014).

Another important study was performed by Katharina Nicolay, Hannah Nusser and Olena Pfeiffer in 2017 and was based on the Riedel et al. (2015) study above but also incorporated thin capitalisation legislation into the model (Nicolay, et al., 2017). This study confirmed the existing empirical evidence that more stringent transfer pricing regulations reduced profit shifting. Similarly, this study also considered only European countries.

A significant study that did consider a developing country was performed by Wier (2018) and utilised South African customs data to consider the OECD reform on South African companies specifically as an indicator for developing countries. The study found that that the "OECD-recommended reform had no long-term impact on transfer mispricing". However, the study considered OECD reform only until the 2012 change in legislation and did not consider the 2016/2017 change, which made transfer pricing documentation compulsory in South Africa. Wier found that transfer mispricing fell in the immediate aftermath (2012 – 2014) of the reform but later (2015) returned to its initial level. Wier

purported that companies' fear of higher audit risk led to the initial response of a reduction in transfer mispricing. However, once it became clear that the tax authority did not increase its enforcement efforts, the effect of the reform disappeared.

Prior to the study performed by Riedel et al. (2015), the significant studies in relation to the effect of policy on profit shifting were those performed by Overesch & Wamser (2010), Buettner et al. (2012), and Blouin et al. (2014). Each of these studies found that MNE Group debt shifting behaviour is reduced by the introduction of thin capitalisation rules/regulations, which restricts the deductibility of interest from taxable income.

### 4.5. Conclusion

This chapter provided detail on the significance of CITs in South Africa and detailed the CIT policy in South Africa, which is aimed at addressing BEPS.

The study then went on to detail and reference studies that have been performed by other researchers, which sought to consider the impact of policy on BEPS. However, it is noted that there are only a few studies which consider transfer pricing regulations or policy specifically and the effect that the introduction of such policy may have on developing economies in particular.

As mentioned, the Riedel et al. (2015) study is the most crucial study found in the research available pertaining to the aforementioned research questions and hypothesis. However, this research focuses specifically on European countries rather than developing countries such as South Africa. Similarly, the 2017 study by Nicolay, Nusser and Pfeiffer also focussed on European countries. While the Wier (2018) study did consider a developing country (South Africa in particular), the study only considered the impact that the 2012 change in Transfer Pricing legislation had on transfer mispricing.

Developing countries face certain specific socio-economic issues including a lack of administrative capacity that may hinder the reduction of profit shifting even where regulations are stringent. According to Nhema (2016), developing countries do not have sufficiently well-coordinated administrative agencies and administrative reform is required. In addition, according to Rathke (2015), governments' tax enforcement is required in order to restrain transfer pricing manipulation and profit shifting by influencing the effectiveness of the tax rules. Therefore, it is uncertain what effect the latest transfer pricing regulations

will have on profit shifting in developing countries like South Africa. The National Treasury (2019) acknowledged this uncertainty in its medium-term budget statement where it was expressed that although measures were taken to increase tax revenue, the expected increase in tax collections had fallen short of expectations due to inefficiencies and structural weaknesses at SARS. Despite the uncertainly, it is expected that the rules should lead to some level of decrease in profit shifting.

The remainder of the research contained in this dissertation will attempt to fill the gap in literature by considering the impact of transfer pricing regulations on South Africa, a developing country. This research will provide an additional contribution compared with the Wier (2018) study because this study considers the impact of the tightening of transfer pricing rules in 2016 and 2017 in addition to the 2012 change considered by the initial study.

The next chapter describes the research methodology utilised in performing the research study.

# CHAPTER 5: RESEARCH DESIGN AND METHODOLOGY

## 5.1. Introduction

This chapter describes the research methodology utilised in performing the research study, including descriptions of the data collected, the method of analysis and the assumptions and expectations of the study.

The key objective of the study is to examine the impact of transfer pricing legislation on the profit shifting behaviour of South African parented multinational enterprises. The study utilises publicly available financial data on South African MNE's and employs econometric methodology and tools to determine the effect that the introduction of transfer pricing documentation rules have had on the South African earnings before interest and tax (EBIT or operating profit). In accounting and finance, EBIT is a measure of a firm's profit that includes all income and expenses (operating and non-operating) and excludes interest expenses and income tax expenses (Bodie, et al., 2004).

## 5.2. Empirical Model

The research study aimed to utilise an existing empirical model, developed and used by Riedel et al. (2015), to examine whether the newly tightened South African transfer pricing rules could limit profit shifting behaviour in South African MNEs.

In their 2015 paper, Riedel et al. (2015) described the study undertaken as having the aim of investigating "whether transfer pricing rules that aim to limit tax-motivated multinational mis-pricing activities are effective in reducing profit shifting behaviour". In order to conduct the study, information was collected on the scope and evolution of national transfer pricing regulations in Europe and was linked with extensive panel data on European MNE's. The findings of Riedel et al. (2015) suggested that the introduction and tightening of transfer pricing rules raises (lowers) reported operating profits of high-tax (low-tax) MNE affiliates. The results showed that regulations were effective in limiting tax-motivated profit shifting behaviour.

Riedel et al. (2015) implemented an empirical model that tested the effects of introducing or tightening transfer pricing laws on multinational affiliates' reported EBIT/operating profits. Their model is specified in equation 5.1. below and explained directly below the specification:

$$LnEBIT_{ijt} = \beta 0 + \beta 1\tau_{it} + \beta 2(\tau_{it} . TP_{it}) + \beta 3TP_{it} + \beta 4X_{it} + \rho_{it} + \varphi_{ij} + \in_{ijt}$$ Equation 5.1.

Left hand side shows the dependent variable $LnEBIT_{ijt}$: Natural log of earnings before interest and tax (EBIT) of affiliate *i* in industry *j* at time *t.* Coefficients of the independent variables show the effect on EBIT as a percentage (due to the natural log)

Right hand side shows the independent variables:
$\beta$: Coefficient
$\tau_{it}$: Host country's corporate tax rate
$TP_{it}$: Dummy variable used to depict the presence of transfer pricing rules (dummy variables are discussed further below)
$\tau_{it} . TP_{it}$: Interaction term between corporate tax rate and transfer pricing rules (interaction terms are discussed further below)
$X_{it}$: Variable firm control variables
$\rho_{it}$: Industry fixed terms
$\varphi_{ij}$: Company fixed terms
$\in_{ijt}$: Error term

Riedel et al. (2015) hypothesised that "tighter transfer pricing laws raise (reduce) the pre-tax profits reported by multinational affiliates in high-tax (low-tax) countries" i.e. the increase (decrease) in EBIT for high tax (low tax) is caused by a reduction in profit shifting.

This model contributed to the growing literature on tax-motivated profit shifting by MNEs. While profit shifting strategies have been studied extensively, this study is one of only a few which consider the effectiveness of legislation aimed at limiting profit shifting. Other studies, which have considered the effect of legislations, include Overesch & Wamser (2010), Buettner et al. (2012) and Blouin et al. (2014) who evidenced that thin capitalization rules that restrict the deductibility of interest payments are effective in limiting multinational debt shifting behaviour. In addition, Ruf & Weichenrieder (2012), Ruf & Weichenrieder (2013) and Egger & Wamser (2015) report evidence that controlled foreign

company regulations are effective in reducing multinational (passive) investments in low-tax jurisdictions. The study by Riedel et al. (2015) supplements the existing literature by illustrating that transfer pricing regulations are another effective legislative method for reducing profit shifting.

### 5.3. Simplified Empirical Model

In order to utilise the model to test South African panel data, the model required a few simple adjustments in order to allow for a logical analysis. Furthermore, a pragmatic approach was required in order to conduct the research study.

The regression equation was estimated using the EViews 10 software (EViews). EViews is an econometric software package for use with time series, cross-section, or longitudinal (panel) data. EViews is used to manage data, perform econometric and statistical analysis, generate forecasts or model simulations, and produce high quality graphs and tables for publication or inclusion in other applications (EViews, 2019).

This approach taken to adapt the model for the application of South African panel data is described below.

a) The corporate tax term was adjusted since all companies were South African, which meant that all host country corporate tax rates would be the same. Therefore, the term $\tau_{it}$ was adjusted to be the average foreign corporate tax rate of the group.

b) The dummy $TP_{it}$ was indicated as 1 (to show the presence of transfer pricing rules) in three different scenarios, bearing in mind that transfer pricing rules have been presented in South African legislation since 1995. However, significant changes to legislation occurred in the following years:

   i. From 2012 through 2017 to indicate the 2012 change in transfer pricing legislation whereby the onus was then on the taxpayer to prove that intercompany transactions were priced at arm's length (a detailed description of this legislation was provided in Chapter 4).

   ii. From 2016 through 2017 to indicate the initial implementation of transfer pricing legislation. Companies that had a CbCR requirement would also have had a compulsory transfer pricing documentation requirement from 1 January 2016 onward.

b. In 2017 only to indicate that most companies would have a compulsory transfer pricing documentation requirement from 2017 onward.

c) $X_{it}$: Variable firm control variables including total assets, number of employees, turnover, interest cover ratio, stock turnover ratio, solvency ratio, total liabilities, ordinary dividends. These variables are discussed further in the next section.

d) While the original model adjusted for fixed effects, it was determined that the fixed effects technique could not be employed for this particular dataset. Therefore, the random effects technique was considered. In general, to decide between a random effects and fixed effects model, researchers often rely on the Hausman (1978) specification test (Clark & Linzer, 2015). The null hypothesis is that the preferred model is random effects and the alternate hypothesis is that the model is fixed effects. A finding that the probability value (p) is less than 0.05 ($p < 0.05$) is taken as evidence that the two models are different enough to reject the null hypothesis, and hence to reject the random effects model in favour of the fixed effects model. A finding that the probability equals zero ($p = 0$) implies the random effects result is no different than the standard ordinary least squares (OLS) result. Note that in statistical hypothesis testing, the probability value is the probability of obtaining test results, which have been observed during the test, assuming that the null hypothesis is correct (Wasserstein & Lazar, 2016).

e) In addition to the correlation identified by EViews, some of the firm data collected may be related due to being listed or unlisted companies or due to operating within the same or similar industries, which may result in correlated error terms or "contemporaneous correlation" (Carter Hill, et al., 2011). Therefore, the specification was also estimated using the seemingly unrelated regression (SUR) model to account for the correlation of the cross-section observations. In econometrics, the Zellner (1962) model of seemingly unrelated regressions (SUR) is a generalisation of a linear regression model consisting of several regression equations where, in theory, each equation has its own dependent variable and explanatory variables. Each equation is a valid linear regression on its own and can be estimated separately, which is why the system is called "seemingly unrelated" as the equations appear to be unrelated but the error terms are actually correlated across the equations (Davidson & MacKinnon, 1993).

f) The results of each of the different techniques were compared to determine which model was better suited to the data set. These estimation techniques are discussed in further detail below.

Following the adjustments, the simplified model is specified by Equation 5.2. as follows:

$$LnEBIT_{ijt} = \beta 0 + \beta 1\tau_{it} + \beta 2(\tau_{it} . TP_{it}) + \beta 3TP_{it} + \beta 4X_{it} + \rho_{it} + \varphi_{ij} + \in_{ijt}$$ Equation 5.2.

The left-hand side shows the dependent variable $LnEBIT_{ijt}$: Natural log of earnings before interest and tax (EBIT) of affiliate *i* in industry *j* at time *t.* Coefficients of the independent variables show the effect on EBIT as a percentage (due to the natural log)

Right hand side shows the independent variables:
$\beta$: Coefficient
$\tau_{it}$: Average group foreign corporate tax rate
$TP_{it}$: Dummy variable used to depict the presence of transfer pricing rules (dummy variables are discussed further in the following chapter)
$\tau_{it} . TP_{it}$: Interaction term between corporate tax rate and transfer pricing rules (interaction terms are discussed further in the following chapter)
$X_{it}$: Variable firm control variables including total assets, number of employees, turnover, interest cover ratio, stock turnover ratio, solvency ratio, total liabilities, ordinary dividends
$\delta_{ij}$: Group/Company random effects / SUR weighting
$\in_{ijt}$: Error term

Note: the subscript *it* indicates the use of panel data, which is detailed in a section below.

The expectations of the model are discussed in Chapter 6.

### 5.4. Firm control variables

The following variables were selected as firm control variables. Other variables are included to control for other factors that may affect profitability (Clausing, 2003). The control variables are related to the dependent variable and controlling for these variables allows for the consideration and interpretation of the transfer pricing effect on the dependent variable (Clausing, 2000). A description of each variable and how it corresponds with the dependent variable is provided below.

a) Total assets: Total assets refers to the total amount of assets owned by an entity. Assets are resources that are controlled by the entity and are expected to result

in future economic benefits flowing to the entity originating from past events (Koppeschaar, et al., 2017). The economic value created by the assets is likely to be linked to the profitability of an entity.

b) Number of employees: the number of employees an entity has alludes to the size of the operations of an entity and is likely to be linked to its profitability.

c) Turnover: Turnover or revenue is the income that arises in the normal course of business and is representative of an inflow of economic benefits (Koppeschaar, et al., 2017). Therefore, turnover is linked to the profitability of an entity.

d) Interest cover ratio: This ratio focusses on the number of times a company can cover its interest expense with its operating income. The higher the ratio, the better off a company is as it is better able to service its debt (Tyran, 1992). Therefore, the interest cover ratio is linked to the profitability of an entity.

e) Stock turnover ratio: Stock or inventory turnover is a measure of an entity's sales efficiency and measures the number of times inventory or stock is sold or used in a given time period such as one year (Tyran, 1992). Since gross profit is earned each time inventory is turned over, the stock turnover ratio is linked to the profitability of an entity.

f) Solvency ratio: the solvency ratio is a ratio used to measure whether a company can meet its long term debts. The solvency ratio quantifies the company's after-tax profit, excluding non-cash expenses such as depreciation compared with the total debt obligations of the firm (Tyran, 1992). Therefore, the solvency ratio is linked to the profitability of an entity.

g) Total liabilities: Total liabilities are the aggregate of the present obligations arising from past events, the settlement of which results in outflows of resource/economic benefits from the entity (Koppeschaar, et al., 2017). While assets create an economic value, liabilities may lead to an economic burden, which may be linked to the profitability of an entity.

h) Ordinary dividends: Ordinary dividends are distributions made by the entity to the equity holders (shareholders) of the company (Koppeschaar, et al., 2017). The distributions made are determined by the availability of retained earnings. Retained earnings reflect the portion of equity that results from operational profits (Tyran, 1992). Since retained earnings are determined by profits, ordinary dividends are linked to the profitability of an entity.

### 5.5. Use of panel data

Baltagi (2005) defines the “term ‘panel data’ refers to the pooling of observations on a cross-section of households, countries, firms, etc. over several time periods”. A longitudinal or panel set of data is a dataset that follows a given sample of a cross section over time, thereby providing multiple observations on each individual in the cross section (Hsiao, 2003).

There are number of reasons why panel data should be used according to Hsiao (2003) and Klevmarken (1989), such as:

a) To control for heterogeneity. Panel data advocates that individuals, firms, states or countries are heterogeneous or diverse. Time-series and cross-section studies that do not control for his heterogeneity run the risk of obtaining biased results due to this diversity.
b) Panel data is better able to study the dynamics of adjustments. Cross-sectional distributions that appear to be stable may actually hide many changes, which can only be seen over time.
c) Panel data is better able to identify and measure effects that are not noticeable in cross-section only or time-series only data – i.e. they are only noted when various cross sections are considered over time.
d) Panel data models assist in constructing and testing more complicated behavioural models than can be tested using purely cross-section or time-series data.

Studenmund (2011), further explains that panel data is useful because it increases sample sizes and provides insight into analytical questions, which cannot be answered by using times-series or cross-sectional data alone. Panel data also allows researchers to avoid omitted variable problems that would otherwise have caused bias in cross-sectional studies. Omitted-variable bias occurs when a statistical model leaves out relevant variables. This results in the effect of the excluded variables being shown as part of the effect of the included variables

However, panel data is not without its flaws. Baltagi (2005) lists some of the limitations of panel data, which include:

a) Design and data collection problems including incomplete population coverage.

b) There may be distortions of measurement errors, which may arise for a number of reasons including faulty responses due to unclear questions, memory errors etc.
c) Collecting panel data is quite costly.

## 5.6. Estimation Techniques

The main purpose of any regression analysis is to take a purely theoretical equation such as the following:

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i \qquad \text{Equation 5.3.}$$

And use a relevant dataset to create an estimated equation such as the following where the "hat" on each coefficient indicates a sample estimate of the true population value.

$$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 X_i \qquad \text{Equation 5.4.}$$

Therefore, the purpose of the estimation technique used is to obtain numerical values for the coefficients of a theoretical regression equation (Equation 5.2) – thereby giving it quantitative value in addition to the already established qualitative value (Studenmund, 2011).

### 5.6.1 Ordinary Least Squares

Ordinary Least Squares (OLS) is the most common technique used in the estimation of the coefficients of econometric models. The OLS technique is a standard technique used and the results are often still shown as a point of reference when other techniques are used (Studenmund, 2011).

OLS is a technique used to estimate a regression by calculating the coefficients so as to minimise the sum of the squared residuals because the residuals are the differences between the actual Ys and the estimated Ys produced by the regression estimation (Studenmund, 2011).

According to Studenmund (2011) there are no less than three important reasons why OLS is used to estimate regressions. These include:

a) OLS is relatively easy to use: OLS is the most simple of all the econometric estimation techniques. The majority of the other techniques uses involve highly complex non-linear formulas or iterative procedures, which require complicated calculations. On the other hand, OLS estimates could technically be computed without using a computer due to their relative simplicity.

b) The goal of minimising the sum of the squared residuals is quite appropriate from a theoretical point of view: since it is reasonable to want the estimated regression to be as close as possible to the observed data you would want to minimise the residuals (the residuals measures how close the estimated regression equation comes to the actual observed data). However, the residuals cannot simply be totalled because their values can be positive or negative so this could cancel values out. Therefore, the square of the residuals is minimised.

c) OLS estimates have a number of useful characteristics including the following:
   i. The sum of the residuals is exactly zero
   ii. OLS can be shown to be the "best" (minimum variance) estimator possible under a set of specific assumption.

Note that an estimator is a mathematical technique applied to a sample of data to produced actual numerical estimates of the true population regression coefficients. Therefore, OLS is an estimator and a coefficient produced by OLS is an estimate.

### 5.6.2 Generalised Least Squares (GLS)

As explained in the previous section, contemporaneous correlation of the error terms was suspected. GLS is a technique for estimating the unknown parameters in a linear regression model when there is a certain degree of correlation between the residuals in a regression model.

GLS regression extends the OLS estimation of the normal linear model by providing for possibly unequal error variances[8] and for correlations between different errors (Fox & Weisberg, 2010).

[8] Note: EViews does not have an option to implement Newey-West for panel data in order to correct for potential unequal variances in the residuals.

GLS is a technique that rids equation of pure first order serial correlation and in the process restores the minimum variance property to the estimation (Studenmund, 2011).

The GLS technique was used in two specifications of the model, the first using random effects and the second using SUR.

### 5.6.3 The Fixed and Random Effects Model

Baltagi (2005) explains the following regarding the fixed and random effects models. "A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables and is stated as follows:

$$y_{it} = \alpha + X'_{it}\beta + \mu_{it} \quad i = 1, \dots, N; t = 1, \dots, T \qquad \text{Equation 5.5.}$$

$i$ denotes households, individuals, firms, countries, etc. and $t$ denotes time. Therefore, $i$ subscript denotes the cross-section dimension whereas the $t$ subscript denotes the time-series dimension. $\alpha$ is a scalar, $\beta$ is K × 1 and $X_{it}$ is the $it$th observation on K explanatory variables" (Baltagi, 2005).

Most of the panel data applications utilize a one-way error component model for the disturbances, with:

$$\mu_{it} = \mu_i + v_{it} \qquad \text{Equation 5.6.}$$

Where, $\mu_i$ denotes the unobservable individual-specific effect and $v_{it}$ denotes the remainder disturbance" (Baltagi, 2005).

In the case of the fixed effects model, the $\mu_i$s are assumed to be fixed parameters to be estimated and the remainder disturbances stochastic (having a random probability distribution) with $v_{it}$ independent and identically distributed $IID\ (0, \sigma_v^2)$. The $X_{it}$ are assumed to be independent of the $v_{it}$ for all $i$ and $t$. The fixed effects model is an appropriate specification if we are focusing on a specific set of $N$ firms, and our inference is restricted to the behaviour of these sets of firms. Alternatively, it could be a set of $N$ OECD countries or $N$ South African provinces or $N$ American states. Inference in this case is conditional on the particular $N$ firms, countries, provinces or states that are observed (Baltagi, 2005).

In the case of the random effects model, the $\mu_i$ can be assumed random. In this case, $\mu_i \sim IID\ (0, \sigma_\mu^2)$, $v_{it} \sim IID\ (0, \sigma_v^2)$, and the $\mu_i$ are independent of the $v_{it}$. In addition, the $X_{it}$ are independent of the $\mu_i$ and $v_{it}$, for all $i$ and $t$ (Baltagi, 2005).

The random effects model is an appropriate specification used when drawing $N$ individuals randomly from a large population. $N$ is usually large and a fixed effects model would lead to an enormous loss of degrees of freedom. The individual effect is characterized as random and inferences can be made for the population from which this sample was randomly drawn (Baltagi, 2005).

Therefore, the random effects models are used in the analysis of panel data when one assumes no fixed effects - it allows for individual effects. The random effects approach is appropriate when drawing "random" draws from a large population ($N$ approaching infinity) to make inferences about the characteristics of the population (De Jager, 2008).

According to EViews (2019), the random effects specifications assumes that the corresponding cross section effects are realisations of independent random variables with mean zero and finite variance.

The Hausman test yielded a p-value of 0, which means that the random effects result is no different than the standard OLS result.

### 5.6.4 Seemingly Unrelated Regressions

The SUR technique "models endogenous variables as linear functions of lagged endogenous variables and all exogenous variables in the system. The system of equations in the model is estimated jointly. This means that the effect of the independent variables on each endogenous variable takes into account the endogenous nature of the other endogenous variables. SUR techniques are also useful because they allow for slope coefficients and the intercept coefficients to vary across cross-sections" (De Jager, 2008). De Jager (2008) noted that allowing for both the slope and intercept coefficients to vary, captures efficiency due to the correlation of disturbances across equations. According to Baltagi (2005), Zellner's SUR approach is popular because it captures the efficiency due to the correlation of the disturbances across equations.

According to the EViews Help Guide, (EViews, 2019), the GLS adjustment 'Period SUR' corrects for heteroscedasticity, which is the violation of Classical Assumption V, which states that the observations of the error terms are drawn from a distribution that has a constant variance Studenmund (2011) and Asteriou & Hall (2011). Therefore, heteroscedasticity refers to the case where the error term that does not have a constant variance.

Period SUR specifically corrects for general correlation of observations within a cross-section. The classical linear regression model (CLRM) "assumes that the variances and correlations between different disturbances are all equal to zero", which implies that the error terms are independently distributed (Asteriou & Hall, 2011). In cases where this assumption is violated, the error terms are said to be serially correlated. Serial correlation can be caused by factors such as omitted variables, misspecification of the model and systematic errors in measurement (Asteriou & Hall, 2007).

According to EViews (2019), period SUR allows for arbitrary heteroscedasticity and serial correlation between the residuals for a given cross-section. A Period SUR specification involves covariances across periods within a given cross-section, as in a seemingly unrelated regressions framework with period specific equations.

"The simplest version of a linear, constant parameter SUR system is one that contains m ≥ 2 linear regression equations, $y_i = X_i \beta_i + \mu_i, i = 1, 2, \dots, m$, where $y_i$ is an $n \times 1$ vector of observations on the $i$th dependent variable, $X_i$ is an $n \times k_i$ matrix with full column rank of observations on the $k_i$ independent variables in the $i$th regression equation, $\beta_i$ is a $k_i \times 1$ vector of regression parameters and $\mu_i$ is an $n \times 1$ vector of zero mean error terms. The usual method of estimating the regression coefficients was to estimate the equations individually by least squares to obtain $\beta_i = (X_i' X_i) - 1 X_i'^{y_i}, i = 1, 2, \dots, m$. However, in Zellner's 1962 work it was shown that when the error terms are correlated across the equations, the equations are related and joint estimation, rather than equation-by-equation estimation, leads to more precise estimates of the regression coefficients and predictions of future values of the dependent variables. The use of SUR techniques leads to improved tests of hypotheses regarding regression coefficients' and other parameters' values" (International Encyclopedia of the Social Sciences, 2019).

### 5.7. Data Sources

In order to utilise the model to obtain results relevant for South Africa, research was undertaken to obtain panel data on South African MNE's specifically. The following pragmatic approach was taken with regard to data collection in order to obtain a suitable set of South African panel data to be employed in the research study:

a) Research was conducted using the Bureau van Dijk Orbis Global Database.

b) The Orbis database contains information on companies worldwide. While the majority of firms in ORBIS are located in developed economies, the data also contains some information on certain countries in the developing world. Orbis data is collected from various (partly private and partly official) sources, which may differ between countries. As a result of the method of collection of data, it is a well-known problem of the Orbis data that the firm coverage differs across countries. Some economies, particularly developing countries, are relatively poorly represented. In this regard, firm coverage tends to be particularly small in Africa, while there is significantly more information available on firms in Latin American, South America and Asia (Fuest & Riedel, 2010). The issue of the absence of comparable data for developing countries is an important one. This is because one cannot compare the profits of companies operating in different regions with one another or try to draw inferences on developing countries based on the data of companies operating in developed countries because the various economic factors in a particular region have an impact on the risk profile, cost structure and consequently, the profit margins of companies (Gonnet, et al., 2014).

c) The Orbis database provides balance sheet information and data on profit and loss account items. In addition, information on ownership structure is included, (relation to all direct and indirect shareholders of the firm) as well as to subsidiaries within the multinational group. Finally, ORBIS provides information, which may allow researchers to determine the location of a parent firms' subsidiaries (Fuest & Riedel, 2010). It should be noted that the database contains lagged financial information, i.e. information for the current financial period is not generally available. At the time of conducting the study, the most complete information was available for the 2017 year.

d) Orbis Global has information on more than 310 million companies across the globe.

e) Only South African companies were selected

f) Only active companies were selected

g) Only companies with available accounts for 2010 (oldest available year) through 2017 (latest complete available year) were selected. Specifically, EBIT was available for all 8 years.

h) The firms included in the analysis belong to multinational groups in the sense that either the parent company or one of their wholly owned subsidiaries was located in a foreign economy.

i) The following financial and descriptive data was downloaded for the 28 companies identified for each of the 8 years (note: only EBIT was available for all companies for all years).

   i. EBIT
   ii. Control variables explained in section 5.4.
   iii. Number, name and county code of subsidiaries
   iv. Group ultimate owner name and country code.

j) The search was refined by selecting only companies where the South African company (i.e. the company included in the dataset) was the Group Ultimate Owner (or parent of the group) since these companies showed their subsidiaries and their relevant countries of operation. Five companies were rejected as they were not the parent company. Therefore, the relevant data for 23 South African companies remained. The anonymised data used is depicted in table 2 below.

**Table 2: Anonymised firm data for 23 South African parented groups**

| GROUP | Year | EBIT USD '000 | Total Assets USD '000 | No of employees | Turnover USD '000 | Interest Cover | Stock turnover | Solvency ratio | Total liabilities USD '000 | Ordinary dividends[9] USD '000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Group A | 2010 | 3 059 162 | 20 402 226 | 33 054 | 16 113 875 | 11.90 | 7.47 | 61.86 | 7 781 152 | -644 309 |
| | 2011 | 4 315 506 | 26 032 259 | 33 708 | 21 055 843 | 17.20 | 7.75 | 61.91 | 9 915 130 | -933 293 |
| | 2012 | 4 352 538 | 24 087 262 | 33 415 | 19 568 318 | 20.39 | 8.48 | 64.75 | 8 489 906 | -927 602 |
| | 2013 | 3 935 515 | 24 398 983 | 32 944 | 17 013 723 | 24.35 | 7.59 | 62.11 | 9 244 783 | -855 280 |
| | 2014 | 4 254 940 | 26 433 765 | 33 400 | 19 522 942 | 25.61 | 7.74 | 62.36 | 9 950 012 | -828 335 |
| | 2015 | 3 737 652 | 26 528 204 | 30 919 | 15 466 827 | 22.52 | 8.15 | 60.72 | 10 420 796 | -613 823 |
| | 2016 | 1 605 263 | 26 443 996 | 30 100 | 11 806 107 | 11.29 | 7.33 | 54.37 | 12 067 289 | -401 190 |
| | 2017 | 2 297 272 | 30 540 902 | 30 900 | 13 327 898 | 12.91 | 6.86 | 54.45 | 13 910 484 | -370 834 |
| Group B | 2010 | 77 938 | 585 688 | 1 620 | 2 247 487 | 4.46 | 30.44 | 58.30 | 244 212 | -12 019 |
| | 2011 | 78 580 | 741 806 | 1 357 | 2 733 654 | 4.50 | 18.52 | 57.79 | 313 095 | -15 610 |
| | 2012 | 71 953 | 578 463 | 1 216 | 2 204 675 | 3.59 | 34.89 | 59.24 | 235 798 | -18 183 |
| | 2013 | 59 582 | 563 837 | 1 112 | 1 872 740 | 3.58 | 10.22 | 56.96 | 242 661 | -14 999 |
| | 2014 | 62 798 | 623 127 | 1 186 | 1 861 685 | 4.13 | 14.87 | 54.19 | 285 447 | -17 118 |
| | 2015 | 69 509 | 576 867 | 1 271 | 1 823 951 | 4.25 | 15.50 | 55.76 | 255 220 | -17 166 |

[9] Depicted as a negative in the companies' financial statements as it is an outflow

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2016 | 66 531 | 462 751 | 776 | 1 667 776 | 5.40 | 15.87 | 61.86 | 176 486 | -15 380 |
| | 2017 | 87 203 | 662 413 | 796 | 2 017 266 | 10.94 | 12.15 | 57.43 | 281 960 | -20 352 |
| Group C | 2010 | 308 901 | 707 984 | 9 408 | 929 189 | n.a. | 15.78 | 80.81 | 135 864 | -58 506 |
| | 2011 | 419 579 | 913 099 | 9 475 | 1 180 544 | n.a. | 15.18 | 81.07 | 172 820 | -65 578 |
| | 2012 | 388 892 | 843 249 | 9 719 | 1 101 819 | n.a. | 13.49 | 86.47 | 114 107 | -80 923 |
| | 2013 | 333 626 | 720 675 | 10 184 | 990 272 | n.a. | 12.70 | 85.60 | 103 775 | -151 643 |
| | 2014 | 316 623 | 761 707 | 10 565 | 1 008 536 | n.a. | 12.39 | 82.24 | 135 251 | -153 469 |
| | 2015 | 281 761 | 750 678 | 11 361 | 948 985 | 516.50 | 10.78 | 81.95 | 135 511 | -59 481 |
| | 2016 | 267 070 | 1 154 709 | 12 037 | 1 152 543 | 17.28 | 7.09 | 50.55 | 570 959 | -53 729 |
| | 2017 | 299 714 | 1 235 526 | 11 563 | 1 415 431 | 12.59 | 9.65 | 58.55 | 512 079 | -61 592 |
| Group D | 2010 | 69 101 | 667 415 | 2 969 | 333 987 | 4.00 | 99.30 | 62.19 | 252 333 | 0 |
| | 2011 | 186 383 | 2 400 754 | n.a. | 955 031 | 3.77 | 37.94 | 51.80 | 1 157 167 | 0 |
| | 2012 | 339 880 | 2 264 345 | n.a. | 1 176 938 | 6.50 | 51.31 | 44.43 | 1 258 259 | 0 |
| | 2013 | 266 691 | 1 894 998 | n.a. | 1 077 420 | 6.52 | 116.59 | 52.34 | 903 250 | -47 728 |
| | 2014 | 259 850 | 1 952 983 | n.a. | 1 017 752 | 7.88 | 104.53 | 50.93 | 958 390 | -62 282 |
| | 2015 | 195 946 | 2 022 863 | 12 847 | 931 526 | 4.04 | 105.03 | 31.20 | 1 391 663 | -47 174 |
| | 2016 | 176 282 | 1 742 250 | 12 747 | 832 671 | 3.84 | 98.14 | 34.96 | 1 133 240 | -43 541 |
| | 2017 | 279 805 | 2 450 965 | 12 854 | 996 192 | 3.49 | 114.98 | 41.36 | 1 437 219 | -50 488 |
| Group E | 2010 | 0 | 737 853 | 12 096 | n.a. | n.a. | n.a. | 51.55 | 357 526 | 0 |
| | 2011 | 154 115 | 792 271 | 10 970 | 1 227 915 | 18.02 | 9.25 | 53.08 | 371 709 | -62 373 |
| | 2012 | 173 892 | 674 148 | 9 816 | 1 028 100 | 45.78 | 8.50 | 65.37 | 233 432 | -50 053 |
| | 2013 | 152 084 | 651 076 | 10 500 | 921 088 | 24.67 | 7.71 | 55.99 | 286 565 | -57 955 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2014 | 172 657 | 669 899 | 10 834 | 982 542 | 33.26 | 7.93 | 59.36 | 272 238 | -58 561 |
| | 2015 | 152 439 | 658 616 | 11 100 | 921 743 | 25.52 | 7.52 | 49.05 | 335 580 | -56 844 |
| | 2016 | 140 032 | 611 236 | 11 587 | 824 959 | 15.85 | 6.80 | 49.71 | 307 381 | -51 751 |
| | 2017 | 166 018 | 709 377 | 10 944 | 1 009 351 | 15.13 | 6.80 | 52.36 | 337 953 | -65 259 |
| Group F | 2010 | 72 838 | 651 689 | 8 262 | 959 987 | 19.83 | 109.67 | 33.44 | 433 743 | -10 195 |
| | 2011 | 69 121 | 728 229 | 8 585 | 997 850 | 17.61 | 88.13 | 36.55 | 462 064 | -6 749 |
| | 2012 | 49 051 | 795 456 | n.a. | 1 082 719 | 9.19 | 85.56 | 35.76 | 511 013 | 0 |
| | 2013 | -12 346 | 680 098 | n.a. | 1 003 733 | -1.27 | 114.55 | 32.80 | 457 009 | 0 |
| | 2014 | 16 289 | 587 912 | 11 421 | 884 739 | 3.60 | 85.35 | 34.85 | 383 009 | 0 |
| | 2015 | 24 267 | 561 183 | 10 295 | 920 017 | 6.68 | 96.56 | 36.78 | 354 778 | 0 |
| | 2016 | 18 332 | 405 472 | 10 476 | 605 070 | 6.06 | 95.92 | 40.06 | 243 057 | 0 |
| | 2017 | -8 156 | 504 198 | 10 412 | 700 283 | -1.16 | 62.87 | 37.19 | 316 681 | 0 |
| Group G | 2010 | 64 015 | 314 867 | 5 552 | 573 312 | 28.25 | 6.27 | 60.15 | 125 481 | -14 950 |
| | 2011 | 73 929 | 304 821 | 5 951 | 547 764 | 74.34 | 6.43 | 63.76 | 110 468 | -11 267 |
| | 2012 | 75 458 | 387 462 | 4 835 | 548 889 | 21.86 | 6.18 | 62.32 | 145 997 | -18 345 |
| | 2013 | 47 195 | 712 432 | 5 870 | 509 986 | 16.85 | 4.23 | 50.70 | 351 249 | -13 279 |
| | 2014 | 69 351 | 685 147 | 5 651 | 642 843 | 6.89 | 4.94 | 53.42 | 319 147 | -13 746 |
| | 2015 | 47 909 | 581 567 | 8 218 | 508 037 | 5.70 | 4.55 | 55.03 | 261 558 | -8 960 |
| | 2016 | 44 320 | 586 881 | 8 673 | 663 841 | 4.00 | 5.65 | 52.04 | 281 456 | -10 160 |
| | 2017 | 62 895 | 657 091 | 9 103 | 781 432 | 4.39 | 5.68 | 51.76 | 316 958 | -12 905 |
| Group H | 2010 | 184 527 | 1 139 370 | 6 422 | 1 537 249 | 185.31 | 12.43 | 56.22 | 498 825 | -62 350 |
| | 2011 | 220 060 | 755 468 | 6 324 | 1 399 218 | 262.62 | 12.77 | 64.45 | 268 558 | -62 379 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2012 | 188 606 | 793 243 | 6 654 | 1 407 946 | 141.16 | 33.26 | 67.43 | 258 346 | -66 327 |
| | 2013 | 132 385 | 733 683 | 6 304 | 1 073 119 | 100.19 | 9.95 | 66.97 | 242 349 | -55 121 |
| | 2014 | 223 174 | 845 425 | 6 288 | 964 026 | 26.63 | 11.11 | 66.09 | 286 714 | -45 524 |
| | 2015 | 99 719 | 677 210 | 5 853 | 618 128 | 51.22 | 8.67 | 71.55 | 192 665 | -39 936 |
| | 2016 | 96 417 | 713 514 | 6 492 | 590 239 | 37.48 | 6.33 | 71.57 | 202 843 | -43 192 |
| | 2017 | 114 230 | 747 383 | 6 609 | 701 380 | 24.60 | 6.58 | 71.79 | 210 829 | -48 337 |
| Group I | 2010 | 2 050 | 808 537 | 5 652 | 168 434 | 5.68 | n.a. | 52.76 | 72 694 | 0 |
| | 2011 | 25 310 | 901 041 | 5 850 | 202 929 | 11.58 | n.a. | 58.48 | 75 720 | -4 133 |
| | 2012 | 27 174 | 739 939 | n.a. | 178 373 | 12.01 | n.a. | 64.95 | 58 070 | 0 |
| | 2013 | 26 658 | 661 695 | 6 025 | 180 752 | 24.50 | n.a. | 68.89 | 47 138 | 0 |
| | 2014 | 23 235 | 596 073 | 6 053 | 184 698 | 21.31 | 424.79 | 71.99 | 41 227 | 0 |
| | 2015 | 22 901 | 548 470 | 6 434 | 172 017 | 29.77 | 308.44 | 73.61 | 34 310 | -3 835 |
| | 2016 | 20 044 | 477 123 | 6 310 | 213 070 | 58.18 | 43.54 | 51.42 | 99 974 | -4 502 |
| | 2017 | 28 070 | 553 399 | 6 311 | 289 739 | 8.12 | 51.58 | 77.52 | 52 810 | 0 |
| Group J | 2010 | 2 769 | 59 295 | 814 | 173 981 | 3.40 | 907.82 | 44.20 | 33 090 | 0 |
| | 2011 | 3 174 | 55 047 | 25 082 | 165 612 | 3.06 | 403.40 | 44.03 | 30 808 | 0 |
| | 2012 | 2 982 | 59 927 | 23 556 | 173 123 | 2.82 | 460.21 | 41.09 | 35 306 | 0 |
| | 2013 | -325 | 50 792 | 26 510 | 158 321 | 0.58 | 643.46 | 39.83 | 30 562 | 0 |
| | 2014 | 4 423 | 48 605 | 32 353 | 155 671 | 3.81 | 584.38 | 48.38 | 25 092 | 0 |
| | 2015 | 4 936 | 44 229 | 33 185 | 122 085 | 3.59 | 461.64 | 51.52 | 21 440 | 0 |
| | 2016 | 6 662 | 64 829 | 33 490 | 179 858 | 3.34 | 897.62 | 50.36 | 32 181 | 0 |
| | 2017 | 6 971 | 80 759 | 35 584 | 225 725 | 3.82 | 785.20 | 54.44 | 36 791 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group K | 2010 | 14 773 | 197 015 | 320 | 166 009 | 8.89 | 35.80 | 57.22 | 84 282 | 0 |
| | 2011 | 21 940 | 230 899 | 1 245 | 205 589 | 19.98 | 35.97 | 58.24 | 96 432 | 0 |
| | 2012 | 22 356 | 235 666 | 1 360 | 185 287 | 10.19 | 23.63 | 57.83 | 99 371 | 0 |
| | 2013 | 21 100 | 269 253 | n.a. | 199 646 | 5.85 | 22.11 | 56.87 | 116 131 | 0 |
| | 2014 | 29 213 | 375 643 | n.a. | 260 375 | 5.27 | 36.26 | 54.58 | 170 631 | 0 |
| | 2015 | 30 784 | 391 730 | 1 573 | 274 739 | 3.90 | 33.62 | 51.18 | 191 233 | 0 |
| | 2016 | 29 643 | 464 819 | 2 135 | 315 894 | 2.81 | 33.95 | 50.23 | 231 362 | 0 |
| | 2017 | -11 123 | 536 199 | n.a. | 339 769 | -0.40 | 19.13 | 54.76 | 242 593 | 0 |
| Group L | 2010 | 42 901 | 766 949 | n.a. | 104 170 | 1.02 | n.a. | 24.56 | 578 605 | 0 |
| | 2011 | 5 301 | 909 548 | n.a. | 135 462 | 0.93 | n.a. | 22.73 | 702 767 | 0 |
| | 2012 | 72 761 | 881 590 | n.a. | 135 244 | 0.99 | n.a. | 30.67 | 611 241 | 0 |
| | 2013 | 17 483 | 1 026 884 | n.a. | 136 819 | 0.84 | n.a. | 27.81 | 741 363 | 0 |
| | 2014 | 36 591 | 1 103 883 | n.a. | 147 576 | 1.12 | n.a. | 26.62 | 810 034 | -133 |
| | 2015 | 123 981 | 1 193 362 | n.a. | 152 374 | 4.34 | n.a. | 71.21 | 343 634 | -27 040 |
| | 2016 | 112 131 | 1 245 934 | n.a. | 159 845 | 3.78 | n.a. | 68.04 | 398 176 | -64 275 |
| | 2017 | 116 460 | 1 319 670 | n.a. | 136 454 | 2.75 | n.a. | 75.27 | 326 357 | -82 314 |
| Group M | 2010 | 63 997 | 1 551 406 | 579 | 190 035 | n.a. | n.a. | 13.15 | 1 347 336 | -9 641 |
| | 2011 | 78 919 | 1 932 838 | 565 | 200 050 | 0.88 | n.a. | 13.19 | 1 677 846 | n.a. |
| | 2012 | 74 632 | 1 870 804 | 558 | 181 253 | 0.81 | n.a. | 15.22 | 1 586 141 | n.a. |
| | 2013 | -40 109 | 2 028 408 | 524 | 165 665 | n.a. | n.a. | 9.15 | 1 842 829 | -16 187 |
| | 2014 | 71 940 | 2 034 184 | 573 | 166 008 | 0.85 | n.a. | 12.52 | 1 779 590 | -20 134 |
| | 2015 | 93 850 | 2 493 872 | 672 | 162 715 | 0.26 | n.a. | 10.64 | 2 228 590 | -27 533 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2016 | 68 722 | 1 951 823 | 743 | 124 805 | -0.06 | n.a. | 13.13 | 1 695 543 | -23 785 |
| | 2017 | 62 865 | 2 063 242 | 714 | 127 631 | -0.14 | n.a. | 12.92 | 1 796 694 | -26 399 |
| Group N | 2010 | 36 510 | 160 944 | 1 555 | 98 050 | 5.92 | 248.71 | 20.54 | 127 881 | -9 919 |
| | 2011 | 27 975 | 183 332 | 1 530 | 115 927 | 3.71 | 331.04 | 20.17 | 146 358 | -6 550 |
| | 2012 | 28 568 | 157 571 | 1 495 | 107 794 | 4.15 | 318.98 | 23.34 | 120 789 | -6 970 |
| | 2013 | 30 167 | 136 176 | 1 530 | 97 270 | 6.83 | 327.67 | 31.00 | 93 957 | -7 480 |
| | 2014 | 35 708 | 160 708 | 1 825 | 100 236 | 7.57 | 162.23 | 33.21 | 107 333 | n.a. |
| | 2015 | 37 404 | 163 850 | 1 866 | 106 827 | 7.19 | 182.97 | 36.40 | 104 215 | -8 173 |
| | 2016 | 30 602 | 149 040 | 1 907 | 101 059 | 7.03 | 193.07 | 39.59 | 90 034 | -7 286 |
| | 2017 | 32 566 | 179 971 | n.a. | 116 395 | 6.71 | 222.12 | 39.74 | 108 444 | -7 605 |
| Group O | 2010 | 3 082 | 16 327 | n.a. | 26 544 | 19.59 | n.a. | 34.21 | 10 741 | -233 |
| | 2011 | 2 669 | 15 494 | 250 | 25 917 | 17.14 | n.a. | 45.59 | 8 430 | -492 |
| | 2012 | 3 139 | 17 906 | 277 | 26 882 | 35.41 | n.a. | 47.77 | 9 353 | -375 |
| | 2013 | 3 046 | 17 714 | 313 | 30 123 | 40.27 | n.a. | 51.61 | 8 572 | -532 |
| | 2014 | 4 798 | 27 986 | 357 | 38 336 | 54.78 | n.a. | 62.38 | 10 528 | 0 |
| | 2015 | 6 406 | 46 060 | 450 | 47 164 | 7.79 | n.a. | 57.15 | 19 737 | -1 155 |
| | 2016 | 8 317 | 65 304 | 664 | 53 886 | 6.30 | n.a. | 48.99 | 33 312 | -1 270 |
| | 2017 | 9 802 | 83 173 | 670 | 76 071 | 5.94 | n.a. | 61.53 | 31 993 | -1 576 |
| Group P | 2010 | 792 | 12 131 | n.a. | 5 931 | n.a. | n.a. | 86.38 | 1 652 | 0 |
| | 2011 | 681 | 12 952 | n.a. | 6 932 | 21.77 | n.a. | 87.78 | 1 583 | -147 |
| | 2012 | -985 | 10 352 | n.a. | 6 590 | n.a. | n.a. | 78.64 | 2 211 | 0 |
| | 2013 | 369 | 8 688 | 154 | 7 657 | 186.67 | n.a. | 79.21 | 1 806 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2014 | 781 | 27 756 | 244 | 22 022 | 5.18 | n.a. | 56.85 | 11 976 | 0 |
| | 2015 | 3 111 | 37 870 | 271 | 53 737 | 13.13 | n.a. | 37.50 | 23 668 | 0 |
| | 2016 | 3 740 | 36 056 | 304 | 60 542 | 13.61 | n.a. | 41.99 | 20 918 | -439 |
| | 2017 | 4 727 | 44 427 | 449 | 78 268 | 9.44 | n.a. | 46.13 | 23 933 | 0 |
| Group Q | 2010 | 16 090 | 69 467 | n.a. | 46 905 | 78.35 | 56.09 | 75.18 | 17 244 | -3 578 |
| | 2011 | 17 140 | 81 563 | n.a. | 60 858 | 121.44 | 73.80 | 73.26 | 21 809 | -4 222 |
| | 2012 | 21 346 | 73 635 | n.a. | 63 275 | 261.32 | 50.37 | 71.25 | 21 169 | -4 942 |
| | 2013 | 19 480 | 69 006 | n.a. | 66 717 | 279.86 | 39.24 | 67.87 | 22 171 | -9 871 |
| | 2014 | 19 040 | 69 603 | n.a. | 70 920 | 779.12 | 61.98 | 70.41 | 20 594 | -10 406 |
| | 2015 | 16 840 | 90 692 | 40 | 65 024 | n.a. | 67.63 | 77.20 | 20 674 | -11 739 |
| | 2016 | 14 803 | 72 197 | n.a. | 53 370 | n.a. | 64.91 | 81.06 | 13 676 | -3 511 |
| | 2017 | 16 442 | 75 879 | n.a. | 51 969 | n.a. | 53.32 | 84.46 | 11 789 | -5 066 |
| Group R | 2010 | 4 506 | 137 473 | n.a. | 97 715 | 1.69 | 4.40 | 32.43 | 92 891 | 0 |
| | 2011 | -5 527 | 135 822 | 630 | 96 872 | -1.26 | 5.75 | 33.78 | 89 946 | 0 |
| | 2012 | 14 242 | 123 883 | n.a. | 98 326 | 8.53 | 7.72 | 49.45 | 62 617 | 0 |
| | 2013 | 11 675 | 107 680 | n.a. | 81 682 | 6.63 | 5.63 | 53.91 | 49 633 | 0 |
| | 2014 | 2 044 | 89 966 | n.a. | 65 764 | -7.61 | 5.07 | 57.71 | 38 050 | 0 |
| | 2015 | 16 190 | 83 740 | n.a. | 77 433 | 22.34 | 8.91 | 65.30 | 29 057 | -5 226 |
| | 2016 | -8 925 | 60 471 | 477 | 45 894 | -33.14 | 6.09 | 60.07 | 24 149 | 0 |
| | 2017 | -12 110 | 51 288 | 490 | 41 437 | -34.86 | 9.28 | 52.35 | 24 439 | 0 |
| Group S | 2010 | 5 289 | 19 188 | 132 | 21 591 | 167.19 | n.a. | 61.32 | 7 422 | -2 353 |
| | 2011 | 6 050 | 25 279 | 146 | 26 287 | 250.95 | n.a. | 65.67 | 8 679 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2012 | 7 024 | 26 761 | n.a. | 27 018 | 699.00 | n.a. | 61.82 | 10 218 | 0 |
| | 2013 | 6 336 | 26 296 | n.a. | 23 558 | 740.23 | n.a. | 64.74 | 9 273 | -1 777 |
| | 2014 | 6 344 | 24 899 | n.a. | 22 925 | n.a. | n.a. | 66.76 | 8 277 | -1 565 |
| | 2015 | 6 429 | 25 553 | n.a. | 20 911 | n.a. | n.a. | 64.76 | 9 005 | -1 691 |
| | 2016 | 5 050 | 20 349 | n.a. | 16 176 | n.a. | n.a. | 72.92 | 5 510 | -1 398 |
| | 2017 | 5 790 | 23 074 | n.a. | 17 975 | n.a. | n.a. | 75.38 | 5 681 | -1 517 |
| Group T | 2010 | 114 544 | 85 807 | n.a. | 123 099 | n.a. | n.a. | 30.66 | 59 502 | 0 |
| | 2011 | 5 735 | 26 280 | n.a. | 1 554 | n.a. | n.a. | 78.99 | 5 522 | 0 |
| | 2012 | 806 | 25 640 | n.a. | 3 483 | n.a. | n.a. | 80.69 | 4 952 | 0 |
| | 2013 | 664 | 19 494 | n.a. | 2 535 | n.a. | n.a. | 91.41 | 1 675 | 0 |
| | 2014 | 11 782 | 15 321 | n.a. | 13 726 | n.a. | n.a. | 91.53 | 1 298 | 0 |
| | 2015 | 320 | 11 700 | n.a. | 495 | n.a. | n.a. | 92.24 | 908 | 0 |
| | 2016 | -634 | 12 925 | n.a. | 471 | -35.47 | n.a. | 90.34 | 1 249 | 0 |
| | 2017 | -569 | 13 513 | n.a. | 753 | n.a. | n.a. | 91.62 | 1 132 | 0 |

As explained above, the corporate tax term was adjusted since all companies were South African. The term $\tau_{it}$ was adjusted to be the average foreign corporate tax rate of the group. In order to calculate the foreign corporate tax rate of the group, the following steps were taken:

a) Subsidiaries of each South African parent company were listed along with their country codes as per Orbis. The country codes shown are ISO 3166-1 alpha-2 codes, which are two-letter country codes defined in ISO 3166-1, part of the ISO 3166 standard published by the International Organization for Standardization (ISO). The standard represents countries, dependent territories, and special areas of geographical interest and are the most widely used of the country codes published by ISO (the others being alpha-3 and numeric) (International Organization for Standardization, 2019).

b) The relevant country of each subsidiary was determined based on the country code as per Orbis.

c) South African subsidiaries and subsidiaries with unknown country codes were removed.

d) The relevant country corporate tax rate was identified for each of the remaining subsidiaries using the Deloitte Corporate Tax Rate guide (Deloitte, 2019).

e) The simple average tax rate was calculated across all the known foreign subsidiaries of the group. It should be noted that it would be more accurate to use the weighted average tax rate, however, complete financial information for each of the foreign subsidiaries was not available; therefore, the weighted average could not be calculated. The simple mean is calculated as the sum of all the observations divided by the number of observations, whereas the weighted average assigns a weight to each observation and then sums the multiple of the weight and the observation and then divides this by the number of observations (Hu, 2010).

f) The anonymised results are shown below.

**Table 3: Anonymised foreign group tax rates for 23 South African parented groups**

| GROUP | Average Group Foreign Tax Rate |
|---|---|
| Group A | 19.72% |
| Group B | 26.92% |

| | |
|---|---|
| Group C | 24.19% |
| Group D | 10.67% |
| Group E | 30.56% |
| Group F | 5.00% |
| Group G | 20.07% |
| Group H | 23.34% |
| Group I | 24.07% |
| Group J | 26.75% |
| Group K | 23.50% |
| Group L | 29.33% |
| Group M | 11.20% |
| Group N | 28.29% |
| Group O | 26.20% |
| Group P | 27.60% |
| Group Q | 24.29% |
| Group R | 26.78% |
| Group S | 30.00% |
| Group T | 0.00% |

## 5.8. Conclusion

This chapter discussed the theoretical and empirical model specifications as well as the estimation techniques used in the study. The techniques considered included OLS, GLS, the fixed and random effects models as well as seemingly unrelated regressions. In addition, the data sources and definition of variables used in the study were discussed in detail.

In summary, the study aimed to employ two different estimation techniques (GLS with random effects and GLS with SUR) in order to estimate the effect of transfer pricing legislation on profit shifting in a sample of South African parented MNE groups. The estimation techniques were compared in order to determine which technique was better suited to the regression and the dataset. This is discussed further in the next chapter along with the results and analysis of the regression estimation.

# CHAPTER 6: ECONOMETRIC ANALYSIS AND EMPIRICAL FINDINGS

## 6.1. Introduction

This chapter presents the econometric analysis and the empirical findings for this study using the model and the methodology discussed in the previous chapter. This study employs GLS techniques in combination with random effects and SUR as the approach to establish the effect of transfer pricing legislation on profit shifting in a sample of South African parented MNE groups.

## 6.2. Sample

As explained in the preceding section, South African parented MNE's were selected due to the availability of information on subsidiary locations. In addition, the consideration of South African parented MNE's is meaningful because of the importance to the South African economy of having MNE firms headquartered in South Africa. It is thought that the activities of a multinational firm headquarters are desirable for an economy due to the positive effects it creates. Having MNE firms headquartered in South Africa creates jobs for South Africans, which stimulates economic activity; the capital investment in a headquarters would build the capital stock, which enables future productivity and growth (Clausing, 2010).

In addition, Clausing (2010) also purports that MNE headquarters usually undertake highly specialised activities, which are more likely to generate learning and innovation, since research, development, and entrepreneurial activities are activities usually conducted by MNE headquarters. Furthermore, multinational firms may be able to generate high profits due to their size, market power, and firm-specific knowledge in addition to being the location of high skilled jobs that attract high wages. The high profits would be available to be taxed in that respective country i.e. South Africa (Dischinger & Riedel, 2009).

The activities of multinational headquarters are additionally beneficial if its activities spill over to the economy at large. For example, research and development could generate learning that benefits other firms and that increases productivity for the entire economy. Similarly, excess profits could influence the economy more widely through enhanced government revenues, increased funds for innovation, or other spill-overs (Clausing, 2010).

A study by Dischinger and Riedel (2009) uses a large firm-level dataset (Amadeus database) of European firms to study the profitability of headquarters firms relative to their subsidiaries. Their results find headquarter firms to be more profitable than their subsidiaries. The profitability gap is found to be about 30 percent. This suggests that multinational headquarters will generate larger profits and subsequently, greater tax payments (Dischinger & Riedel, 2010). Therefore, headquarter firms are important to an economy as they tend to produce useful economic spill-overs.

### 6.3. Use of dummies and interaction terms

A dummy (or binary or dichotomous) variable is an indicator variable, which is used to account for qualitative factors in an econometric model. A dummy variable takes on one of two values – generally, one or zero to indicate the presence or absence of a characteristic or to indicate whether a certain condition is true or false. A dummy variable indicates the creation of a numeric variable for a qualitative, non-numeric characteristic (Carter Hill, et al., 2011). In this analysis the presence of transfer pricing rules, and changes to those rules, is depicted through the use of a dummy variable.

In some case it may be expected that the effect of one variable is modified by another. An interaction variable that is the product of the two variables involved can be used to account for such interactions between two variables (Carter Hill, et al., 2011). In other words, the effect of one independent variable on the dependent variable is different at different values of the other independent variable. Therefore, adding a term to the model that multiplies the two variables captures this effect (Cornell Statistical Consulting Unit, 2000). In this analysis an interaction term has been included to indicate the additional effect of the transfer pricing rules on profit shifting (through EBIT) depending on the groups' foreign tax rate. This is based on the assumption that the group's foreign tax rate is reflective of its level of profit shifting.

### 6.4. Expectations

In the baseline results of the Riedel et al. (2015) study, they found that $\beta 2$ = 1.709 and $\beta 3$ = -0.468. The results suggested a significant effect of transfer price documentation requirements on their tested firms' EBIT. For affiliates subject to a corporate tax rate of 30%, reported EBIT was found to increase by 4.5% on average. For affiliates in higher-tax (lower-tax) countries with corporate tax rates at the 75th and 90th (10th) percentile of their sample's corporate tax rate distribution (corresponding to tax rates of 34.5% and

37.25% (19%) respectively), reported EBIT was found to increase by 12.2% and 16.9% (decrease by 14.3%). These percentages were obtained by considering the impact of $\beta 2$ and $\beta 3$ together as these, together, show the impact of transfer pricing rules on EBIT. The relevant portion of the model is depicted below:

$$LnEBIT_{ijt} = \beta 2(\tau_{it} . TP_{it}) + \beta 3TP_{it} \qquad \text{Equation 6.1}$$

Therefore, the effect of transfer pricing rules on EBIT based on the test by Riedel et al. (2015) is as follows:

$$LnEBIT = (1.709.\tau) + (-0.468) \qquad \text{Equation 6.2}$$

In the simplified model applied to South African firm data, it was assumed that that profits (EBIT) were shifted away from South Africa when the foreign average corporate tax rate is lower than South African corporate tax rate (i.e. lower than 28%) i.e. profits are shifted to countries where they would be taxed at a lower rate.

Therefore, it was expected that the introduction of transfer pricing rules would lead to a resultant increase in EBIT reported by the South African entities, which formed part of a group that had an average foreign corporate tax rate lower than the South African rate of 28%. In other words, it was expected that South African companies would reduce profit shifting to lower tax countries and start to report higher profits in South Africa, which would be available to be taxed at the South African tax rate of 28%.

Therefore, the expectation was:

$$\beta 2(\tau_{it} . TP_{it}) + \beta 3TP_{it} > 0 \; when \; \tau < 28\% \qquad \text{Equation 6.3}$$

In addition, it was expected that $\beta 3TP_{it} > 0$ on a standalone basis, when $\tau < 28\%$. Therefore, the sign of the transfer pricing rules was undetermined since it is dependent on the particular foreign tax rate.

It should be noted that, unlike the Riedel et al. (2015) test, the opposite was not expected since it would not generally be expected that EBIT would decrease when rules are introduced when the average foreign corporate tax rate is above 28%. This is because SA

is not considered to be a low tax region so it is very unlikely profits are shifted to South Africa in the first instance.

### 6.5. Random Effects and the Hausman Test

In order to determine the appropriateness of the random effects model, the Hausman test was run and the following warning was displayed:

*WARNING: estimated cross section effects variance is zero*

The Hausman test results showed that p = 0. As explained previously, this would imply that the random effects results is no different than the standard OLS result. Therefore, in the remainder of this text, the standard OLS technique is referred to rather than the random effects technique.

### 6.6. P-values

In statistical hypothesis testing, the p-value or the probability value is the probability of obtaining test results, which have been observed during the test, assuming that the null hypothesis is correct (Wasserstein & Lazar, 2016). Note that the null hypothesis is a general statement or default position that there is nothing new happening i.e. there is no relationship between two measured phenomena (Everitt, 1998).

In other words, the p-value tells us the probability of obtaining the test results we have obtained if there were no relationship between the estimated variable and the dependent variable. When the p-value is very low it tells us that the null hypothesis must be rejected (i.e. that we could not have obtained the results if the null hypothesis held true; therefore, there must be a relationship between the estimated variable(s) and the dependent variable) (Studenmund, 2011).

In the following sections, the p-values of specific estimated variables in relation to the dependent variable are shown in the results tables under the column heading ‘probability’. Similarly, the p-value of the entire regression is shown in the table in line with the row heading ‘Prob (F-statistic)’.

### 6.7. Descriptive Statistics

The following table shows the descriptive statistics of the dataset used in this analysis.

**Table 4: Descriptive Statistics (Author's compilation)**

| Variable [10] | Mean | Median | Maximum | Minimum | Standard deviation | Observations |
|---|---|---|---|---|---|---|
| *EBIT* | 235207.7 | 29428 | 4352538 | -40109 | 774657.1 | 160 |
| *Rules12* | 0.75 | 1 | 1 | 0 | 0.434372 | 160 |
| *Rules16* | 0.25 | 0 | 1 | 0 | 1.434372 | 160 |
| *Rules17* | 0.125 | 0 | 1 | 0 | 0.331757 | 160 |
| *Interaction12* | 0.164424 | 0.2334 | 0.305556 | 0 | 0.119709 | 160 |
| *Interaction16* | 0.054808 | 0 | 0.305556 | 0 | 0.104031 | 160 |
| *Interaction17* | 0.027404 | 0 | 0.305556 | 0 | 0.07853 | 160 |
| *Foreign Tax Rate* | 0.219232 | 0.242407 | 0.305556 | 0 | 0.08376 | 160 |
| *Interest cover ratio* | 44.59235 | 7.38 | 779.12 | -35.47 | 124.9498 | 136 |
| *Number of employees* | 8363.928 | 5951 | 35584 | 40 | 9998.738 | 111 |
| *Ordinary dividends* | -51128.2 | -4133 | 0 | -9333293 | 159697.6 | 157 |
| *Solvency ratio* | 54.78194 | 56.105 | 92.24 | 9.15 | 18.9355 | 160 |
| *Stock turnover ratio* | 99.96626 | 22.11 | 907.82 | 4.23 | 182.0605 | 107 |
| *Total assets* | 1809954 | 550934 | 30540902 | 8688 | 5541298 | 160 |
| *Total liabilities* | 788557.1 | 135381 | 13910484 | 908 | 2251630 | 160 |
| *Turnover* | 1280665 | 179858 | 21055843 | 471 | 3672584 | 159 |

[10] Note: the firm explanatory variables were not logged. These include, Foreign Tax Rate, Interest cover ratio, Number of employees, Ordinary dividends, Solvency ratio, Stock turnover ratio, Total assets, Total liabilities, Turnover. These variables were included as additional control variables and this study does not analyse the relationship of these variables with the dependent variable.

## 6.8. Standard OLS: Results

In this section, the results of the model estimation using standard OLS on EViews 10 in each of three transfer pricing rules dummy scenarios (2012 – 2017, 2016 – 2017 and 2017 only) are summarised. Due to the suspected contemporaneous correlation, the OLS results are summarised whilst the SUR results are shown in detail. It is noted that the overall effect of the transfer pricing rules on EBIT is measured by the effect of the transfer pricing rules coefficient and the interaction term coefficient combined as explained further below.

### 6.8.1. Transfer Pricing Rules 2012 – 2017

The Standard OLS estimates for rules from 2012 -2017 indicated that six out of twelve explanatory variables were significantly associated with the natural log of EBIT or percentage changes in EBIT, while six explanatory variables were statistically insignificant determinants of the natural log of EBIT. Total assets, ordinary dividends, stock turnover ratio, total liabilities and the constant term were significant at the one percent level of significance. The interest cover ratio was significant at the five percent significance level.

The standard OLS estimate did not find a significant relationship between the foreign tax rate, the rules dummy, the interaction term, number of employees, solvency ratio and turnover and the natural log of EBIT.

Based on the OLS results with rules from 2012 - 2017, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (3.942721.\tau) + (-0.694633) \qquad \text{Equation 6.4}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 5: OLS Estimation Results with rules from 2012-2017**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| -0.694633 | 3.942721 | 0.00% | -69.46% |

| | | | |
|---|---|---|---|
| -0.694633 | 3.942721 | 1.00% | -65.52% |
| -0.694633 | 3.942721 | 2.00% | -61.58% |
| -0.694633 | 3.942721 | 3.00% | -57.64% |
| -0.694633 | 3.942721 | 4.00% | -53.69% |
| -0.694633 | 3.942721 | 5.00% | -49.75% |
| -0.694633 | 3.942721 | 6.00% | -45.81% |
| -0.694633 | 3.942721 | 7.00% | -41.86% |
| -0.694633 | 3.942721 | 8.00% | -37.92% |
| -0.694633 | 3.942721 | 9.00% | -33.98% |
| -0.694633 | 3.942721 | 10.00% | -30.04% |
| -0.694633 | 3.942721 | 11.00% | -26.09% |
| -0.694633 | 3.942721 | 12.00% | -22.15% |
| -0.694633 | 3.942721 | 13.00% | -18.21% |
| -0.694633 | 3.942721 | 14.00% | -14.27% |
| -0.694633 | 3.942721 | 15.00% | -10.32% |
| -0.694633 | 3.942721 | 16.00% | -6.38% |
| -0.694633 | 3.942721 | 17.00% | -2.44% |
| -0.694633 | 3.942721 | 18.00% | 1.51% |
| -0.694633 | 3.942721 | 19.00% | 5.45% |
| -0.694633 | 3.942721 | 20.00% | 9.39% |
| -0.694633 | 3.942721 | 21.00% | 13.33% |
| -0.694633 | 3.942721 | 22.00% | 17.28% |
| -0.694633 | 3.942721 | 23.00% | 21.22% |
| -0.694633 | 3.942721 | 24.00% | 25.16% |
| -0.694633 | 3.942721 | 25.00% | 29.10% |
| -0.694633 | 3.942721 | 26.00% | 33.05% |
| -0.694633 | 3.942721 | 27.00% | 36.99% |
| -0.694633 | 3.942721 | 28.00% | 40.93% |
| -0.694633 | 3.942721 | 29.00% | 44.88% |
| -0.694633 | 3.942721 | 30.00% | 48.82% |
| -0.694633 | 3.942721 | 31.00% | 52.76% |
| -0.694633 | 3.942721 | 32.00% | 56.70% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 18% and 27% increased EBIT with the addition of transfer pricing rules. Therefore, a portion (not all) of the results were in line with the expectation after the implementation of the 2012 transfer pricing rules.

### 6.8.2. Transfer Pricing Rules 2016 – 2017

The Standard OLS estimates for rules from 2016 - 2017 indicated that six out of twelve explanatory variables were significantly associated with the natural log of EBIT or percentage changes in EBIT, while six explanatory variables were statistically insignificant determinants of the natural log of EBIT. Total assets, ordinary dividends, stock turnover ratio, total liabilities and the constant term were significant at the one percent level of significance. The interest cover ratio was significant at the five percent significance level.

The standard OLS estimate did not find a significant relationship between the foreign tax rate, the rules dummy, the interaction term, number of employees, solvency ratio and turnover and the natural log of EBIT.

Based on the OLS results with rules from 2016 - 2017, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (0.956998.\tau) + (-0.025395) \qquad \text{Equation 6.5}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 6: OLS Estimation Results with rules from 2016-2017**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| -0.025395 | 0.956998 | 0.00% | -2.54% |
| -0.025395 | 0.956998 | 1.00% | -1.58% |
| -0.025395 | 0.956998 | 2.00% | -0.63% |
| -0.025395 | 0.956998 | 3.00% | 0.33% |
| -0.025395 | 0.956998 | 4.00% | 1.29% |

| | | | |
|---|---|---|---|
| -0.025395 | 0.956998 | 5.00% | 2.25% |
| -0.025395 | 0.956998 | 6.00% | 3.20% |
| -0.025395 | 0.956998 | 7.00% | 4.16% |
| -0.025395 | 0.956998 | 8.00% | 5.12% |
| -0.025395 | 0.956998 | 9.00% | 6.07% |
| -0.025395 | 0.956998 | 10.00% | 7.03% |
| -0.025395 | 0.956998 | 11.00% | 7.99% |
| -0.025395 | 0.956998 | 12.00% | 8.94% |
| -0.025395 | 0.956998 | 13.00% | 9.90% |
| -0.025395 | 0.956998 | 14.00% | 10.86% |
| -0.025395 | 0.956998 | 15.00% | 11.82% |
| -0.025395 | 0.956998 | 16.00% | 12.77% |
| -0.025395 | 0.956998 | 17.00% | 13.73% |
| -0.025395 | 0.956998 | 18.00% | 14.69% |
| -0.025395 | 0.956998 | 19.00% | 15.64% |
| -0.025395 | 0.956998 | 20.00% | 16.60% |
| -0.025395 | 0.956998 | 21.00% | 17.56% |
| -0.025395 | 0.956998 | 22.00% | 18.51% |
| -0.025395 | 0.956998 | 23.00% | 19.47% |
| -0.025395 | 0.956998 | 24.00% | 20.43% |
| -0.025395 | 0.956998 | 25.00% | 21.39% |
| -0.025395 | 0.956998 | 26.00% | 22.34% |
| -0.025395 | 0.956998 | 27.00% | 23.30% |
| -0.025395 | 0.956998 | 28.00% | 24.26% |
| -0.025395 | 0.956998 | 29.00% | 25.21% |
| -0.025395 | 0.956998 | 30.00% | 26.17% |
| -0.025395 | 0.956998 | 31.00% | 27.13% |
| -0.025395 | 0.956998 | 32.00% | 28.08% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 3% and 27% increased EBIT with the addition of transfer pricing rules. Therefore, a greater portion of the results were in line with the expectation after the implementation of the 2016 transfer pricing rules, compared with the implementation of the 2012 rules.

### 6.8.3. Transfer Pricing Rules 2017 only

The Standard OLS estimates for rules in 2017 only indicated that six out of twelve explanatory variables were significantly associated with the natural log of EBIT or percentage changes in EBIT, while six explanatory variables were statistically insignificant determinants of the natural log of EBIT. Total assets, ordinary dividends, stock turnover ratio, total liabilities and the constant term are significant at the one percent level of significance. The interest cover ratio was significant at the five percent significance level.

The standard OLS estimate did not find a significant relationship between the foreign tax rate, the rules dummy, the interaction term, number of employees, solvency ratio and turnover and the natural log of EBIT.

Based on the OLS results with rules in 2017 only, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (-2.869434.\tau) + (1.092401) \qquad \text{Equation 6.6}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 7: OLS Estimation Results with rules from 2017 only**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| 1.092401 | -2.869434 | 0.00% | 109.24% |
| 1.092401 | -2.869434 | 1.00% | 106.37% |
| 1.092401 | -2.869434 | 2.00% | 103.50% |
| 1.092401 | -2.869434 | 3.00% | 100.63% |
| 1.092401 | -2.869434 | 4.00% | 97.76% |
| 1.092401 | -2.869434 | 5.00% | 94.89% |
| 1.092401 | -2.869434 | 6.00% | 92.02% |
| 1.092401 | -2.869434 | 7.00% | 89.15% |
| 1.092401 | -2.869434 | 8.00% | 86.28% |

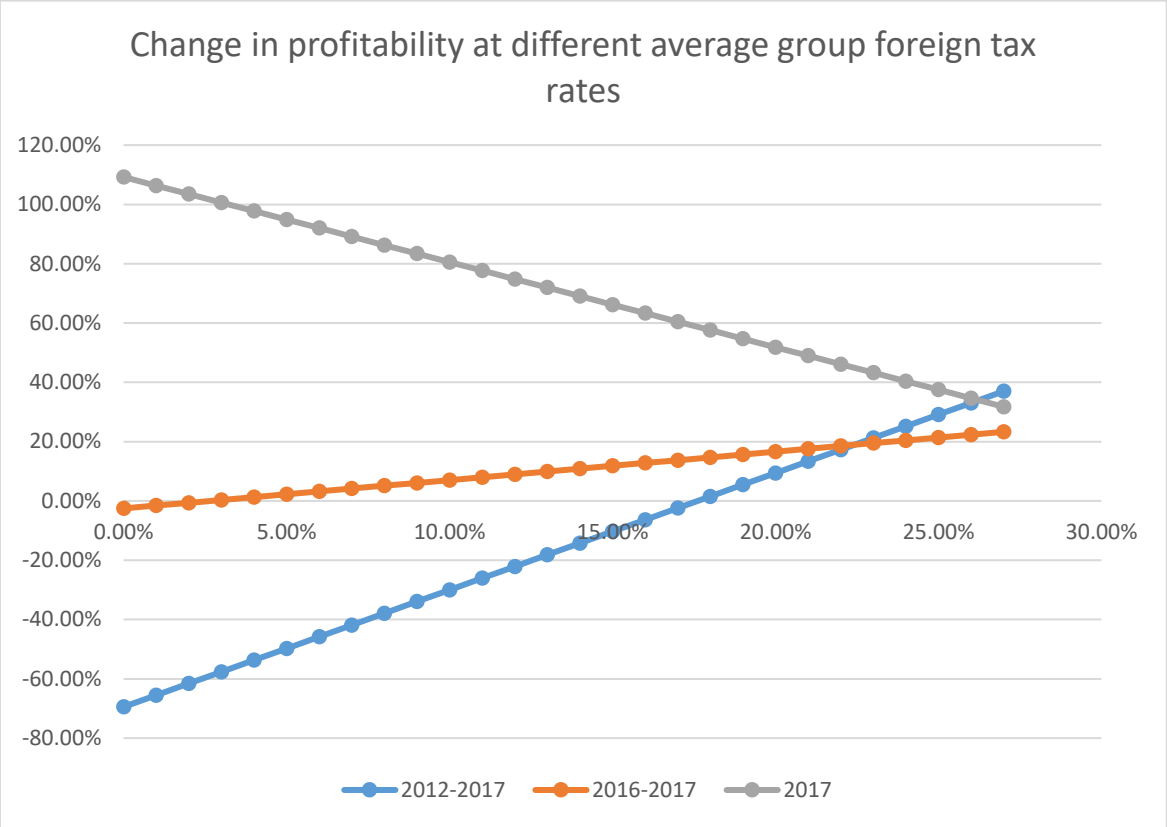
| | | | |
|---|---|---|---|
| 1.092401 | -2.869434 | 9.00% | 83.42% |
| 1.092401 | -2.869434 | 10.00% | 80.55% |
| 1.092401 | -2.869434 | 11.00% | 77.68% |
| 1.092401 | -2.869434 | 12.00% | 74.81% |
| 1.092401 | -2.869434 | 13.00% | 71.94% |
| 1.092401 | -2.869434 | 14.00% | 69.07% |
| 1.092401 | -2.869434 | 15.00% | 66.20% |
| 1.092401 | -2.869434 | 16.00% | 63.33% |
| 1.092401 | -2.869434 | 17.00% | 60.46% |
| 1.092401 | -2.869434 | 18.00% | 57.59% |
| 1.092401 | -2.869434 | 19.00% | 54.72% |
| 1.092401 | -2.869434 | 20.00% | 51.85% |
| 1.092401 | -2.869434 | 21.00% | 48.98% |
| 1.092401 | -2.869434 | 22.00% | 46.11% |
| 1.092401 | -2.869434 | 23.00% | 43.24% |
| 1.092401 | -2.869434 | 24.00% | 40.37% |
| 1.092401 | -2.869434 | 25.00% | 37.50% |
| 1.092401 | -2.869434 | 26.00% | 34.63% |
| 1.092401 | -2.869434 | 27.00% | 31.77% |
| 1.092401 | -2.869434 | 28.00% | 28.90% |
| 1.092401 | -2.869434 | 29.00% | 26.03% |
| 1.092401 | -2.869434 | 30.00% | 23.16% |
| 1.092401 | -2.869434 | 31.00% | 20.29% |
| 1.092401 | -2.869434 | 32.00% | 17.42% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 0% and 27% increased EBIT with the addition of transfer pricing rules. This is in line with the expectation stated in section 6.4. Therefore, a greater portion of the results were in line with the expectation after the implementation of the 2017 transfer pricing rules, compared with the implementation of the 2016 rules. Furthermore, the coefficient of the rules dummy is positive, as expected.

### 6.8.4. Summary of standard OLS results

The following figure summarises the percentage changes in EBIT for each different average foreign tax rate in each of the three transfer pricing rules scenarios.

**Figure 6: Change in EBIT with the introduction of transfer pricing rules in all transfer pricing rules scenarios (Standard OLS)**




The figure above shows that with each improvement or tightening of the transfer pricing rules 2012 versus 2016 versus 2017, more of the average group foreign tax rates begin to show an increase in South African EBIT. This can be interpreted as an indication that the tightening of transfer pricing rules leads to a reduction in profit shifting, based on the understanding that reduced profit shifting by South African MNEs would increase their South African profitability (i.e. increasing the amount of profits available to be taxed in South Africa).

Therefore, the results of the model using the standard OLS estimation technique were partially in line with the expectations set forth in section 6.4. above when the rules were less stringent (2012) and become increasingly more in line with the expectations as the

rules become more stringent (2016) and are completely in line with the expectations when the rules are the most stringent (2017).

In the next section, the results of the model using the SUR technique are discussed.

## 6.9. SUR: Results

In this section, the results of the model estimation using GLS and SUR on EViews 10 in each of three transfer pricing rules dummy scenarios (2012 – 2017, 2016 – 2017 and 2017 only) are depicted.

### 6.9.1. Transfer Pricing Rules 2012 – 2017

The following table shows the estimation results of the transfer pricing rules 2012 – 2017 scenario.

**Table 8: Generalised Least Squares with Seemingly Unrelated Regression Results 2012 – 2017 (Author's compilation)**

| **Rules 2012-2017 / Dependent Variable: LnEBIT** | | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std Error** | **t-Statistic** | **Probability** |
| Foreign Tax Rate | -0.986024 | 1.363413 | -0.723203 | 0.4723 |
| Rules 2012 | -0.750127 (**) | 0.3615 | -2.075039 | 0.0422 |
| Interaction Term: Rules 2012*Foreign Tax Rate | 3.479707 (**) | 1.536877 | 2.264142 | 0.0271 |
| Total Assets | -0.00000133 (***) | 2.38E-07 | -5.608501 | 0.0000 |
| Number of employees | -0.0000219 (***) | 7.62E-06 | -2.869479 | 0.0056 |
| Interest cover ratio | 0.002657 (***) | 0.000757 | 3.5087 | 0.0009 |
| Ordinary Dividends | -0.0000142 (***) | 2.16E-06 | -6.599898 | 0.0000 |
| Solvency ratio | 0.01475 (**) | 6.63E-03 | 2.224183 | 0.0298 |

| | | | | |
|---|---|---|---|---|
| Stock turnover ratio | -0.002326 (***) | 4.18E-04 | -5.56449 | 0.0000 |
| Total liabilities | 0.00000296 (***) | 4.85E-07 | 6.093696 | 0.0000 |
| Turnover | -7.55E-08 | 1.03E-07 | -0.73246 | 0.4667 |
| Constant | 10.37393 (***) | 4.30E-01 | 24.11086 | 0.0000 |
| **Weighted Stats** | | | | |
| R-squared | 0.922289 | Mean dependent var | 18.1916 | |
| Adjusted R-squared | 0.908275 | S.D. dependent var | 11.03867 | |
| S.E. of regression | 0.915101 | Sum squared resid | 51.08203 | |
| F-statistic | 65.81417 | Durbin-Watson stat | 2.084087 | |
| Prob (F-statistic) | 0.000000 | | | |
| **Unweighted Stats** | | | | |
| R-squared | 0.883702 | Mean dependent var | 11.3046 | |
| Sum squared resid | 24.86863 | Durbin-Watson stat | 1.498399 | |

Notes: (***), (**), (*) indicate one percent, five percent and ten percent level of significance, respectively.

The GLS with SUR estimates above indicate that ten out of twelve explanatory variables are significantly associated with the natural log of EBIT or percentage changes in EBIT, while two explanatory variables are statistically insignificant determinants of the natural log of EBIT. The control variables, namely total assets, number of employees, interest cover ratio, ordinary dividends, stock turnover ratio, total liabilities and the constant term are significant at the one percent level of significance. The rules dummy, the interaction term, and the solvency ratio are significant at the five percent significance level. Although most of the control variables are significant, the percentage change in EBIT is small.

a) When transfer pricing rules are implemented in South Africa, the EBIT of the South African parent entity decreases by 0.750127%
b) When transfer pricing rules are implemented in South Africa, the EBIT of the South African parent entity increases by 3.479707% times the foreign group tax rate. This means there is an additional 3.479707% increase for every percentage increase in the foreign tax rate.

c) For a USD1000 increase in total assets, the EBIT of the South African parent entity decreases by 0.00000133%
d) For a one times increase in the interest cover ratio, the EBIT of the South African parent entity increases by 0.002657%
e) For a USD1000 increase in ordinary dividends, the EBIT of the South African parent entity decreases by 0.0000142%
f) For a one times increase in the stock turnover ratio, the EBIT of the South African parent entity decreases by 0.002326%
g) For a USD1000 increase in total liabilities, the EBIT of the South African parent entity increases by 0.00000296%
h) For a one times increase in the solvency ratio, the EBIT of the South African parent entity increases by 0.01475%

Based on the GLS with SUR results with rules from 2012 - 2017, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (3.479707.\tau) + (-0.750127) \qquad \text{Equation 6.7}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 9: GLS with SUR Estimation Results with rules from 2012-2017**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| -0.750127 | 3.479707 | 0.00% | -75.01% |
| -0.750127 | 3.479707 | 1.00% | -71.53% |
| -0.750127 | 3.479707 | 2.00% | -68.05% |
| -0.750127 | 3.479707 | 3.00% | -64.57% |
| -0.750127 | 3.479707 | 4.00% | -61.09% |
| -0.750127 | 3.479707 | 5.00% | -57.61% |
| -0.750127 | 3.479707 | 6.00% | -54.13% |
| -0.750127 | 3.479707 | 7.00% | -50.65% |
| -0.750127 | 3.479707 | 8.00% | -47.18% |
| -0.750127 | 3.479707 | 9.00% | -43.70% |

| | | | |
|---|---|---|---|
| -0.750127 | 3.479707 | 10.00% | -40.22% |
| -0.750127 | 3.479707 | 11.00% | -36.74% |
| -0.750127 | 3.479707 | 12.00% | -33.26% |
| -0.750127 | 3.479707 | 13.00% | -29.78% |
| -0.750127 | 3.479707 | 14.00% | -26.30% |
| -0.750127 | 3.479707 | 15.00% | -22.82% |
| -0.750127 | 3.479707 | 16.00% | -19.34% |
| -0.750127 | 3.479707 | 17.00% | -15.86% |
| -0.750127 | 3.479707 | 18.00% | -12.38% |
| -0.750127 | 3.479707 | 19.00% | -8.90% |
| -0.750127 | 3.479707 | 20.00% | -5.42% |
| -0.750127 | 3.479707 | 21.00% | -1.94% |
| -0.750127 | 3.479707 | 22.00% | 1.54% |
| -0.750127 | 3.479707 | 23.00% | 5.02% |
| -0.750127 | 3.479707 | 24.00% | 8.50% |
| -0.750127 | 3.479707 | 25.00% | 11.98% |
| -0.750127 | 3.479707 | 26.00% | 15.46% |
| -0.750127 | 3.479707 | 27.00% | 18.94% |
| -0.750127 | 3.479707 | 28.00% | 22.42% |
| -0.750127 | 3.479707 | 29.00% | 25.90% |
| -0.750127 | 3.479707 | 30.00% | 29.38% |
| -0.750127 | 3.479707 | 31.00% | 32.86% |
| -0.750127 | 3.479707 | 32.00% | 36.34% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 22% and 27% increased EBIT with the addition of transfer pricing rules. Therefore, a portion (not all) of the results were in line with the expectation after the implementation of the 2012 transfer pricing rules.

### 6.9.2. Transfer Pricing Rules 2016 – 2017

The following table shows the estimation results of the transfer pricing rules 2016 – 2017 scenario.

**Table 10: Generalised Least Squares with Seemingly Unrelated Regression Results 2016 – 2017 (Author's compilation)**

| **Rules 2016-2017 / Dependent Variable: LnEBIT** | | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std Error** | **t-Statistic** | **Probability** |
| Foreign Tax Rate | 0.719912 | 0.929526 | 0.774493 | 0.4416 |
| Rules 2016 | -0.308813 | 0.487819 | -0.633049 | 0.5291 |
| Interaction Term: Rules 2016*Foreign Tax Rate | 1.630958 | 2.113113 | 0.771827 | 0.4432 |
| Total Assets | -0.00000123 (***) | 0.000000233 | -5.288879 | 0.0000 |
| Number of employees | -0.0000245 (***) | 0.00000753 | -3.2564 | 0.0018 |
| Interest cover ratio | 0.002686 (***) | 0.000767 | 3.502229 | 0.0009 |
| Ordinary Dividends | -0.0000137 (***) | 0.00000207 | -6.647182 | 0.0000 |
| Solvency ratio | 0.015357 (**) | 0.006734 | 2.280545 | 0.0261 |
| Stock turnover ratio | -0.002405 (***) | 0.000408 | -5.899278 | 0.0000 |
| Total liabilities | 0.00000274 (***) | 0.000000477 | 5.735898 | 0.0000 |
| Turnover | -8.52E-08 | 9.22E-08 | -0.923436 | 0.3594 |
| Constant | 10.05164 (***) | 0.34251 | 29.34695 | 0.0000 |
| **Weighted Stats** | | | | |
| R-squared | 0.914856 | Mean dependent var | 18.55502 | |
| Adjusted R-squared | 0.899502 | S.D. dependent var | 9.434512 | |
| S.E. of regression | 0.918729 | Sum squared resid | 51.48783 | |
| F-statistic | 59.58475 | Durbin-Watson stat | 1.959957 | |
| Prob (F-statistic) | 0.000000 | | | |
| **Unweighted Stats** | | | | |
| R-squared | 0.882031 | Mean dependent var | 11.3046 | |
| Sum squared resid | 25.22606 | Durbin-Watson stat | 1.340389 | |

Notes: (***), (**), (*) indicate one percent, five percent and ten percent level of significance, respectively.

The GLS with SUR estimate did not find a significant relationship between the foreign tax rate, rules dummy, the interaction term and turnover and the natural log of EBIT. The lack of significance of the rules dummy and the interaction term in this scenario is unexpected and not in line with the other scenarios using GLS and SUR. The result could be due to the fact that the time period observed is quite short and the data for this particular time period may not have shown a strong enough relationship even though the other scenarios did.

The GLS with SUR estimates above indicate that eight out of twelve explanatory variables are significantly associated with the natural log of EBIT or percentage changes in EBIT, while four explanatory variables are statistically insignificant determinants of the natural log of EBIT. Total assets, number of employees, interest cover ratio, ordinary dividends, stock turnover ratio, total liabilities and the constant term are significant at the one percent level of significance. The solvency ratio is significant at the five percent significance level. Although most of the control variables showed significance, the percentage change in EBIT is relatively small.

a) For a USD1000 increase in total assets, the EBIT of the South African parent entity decreases by 0.00000123%.
b) For every additional employee, the EBIT of the South African parent entity decreases by 0.0000245%.
c) For a one times increase in the interest cover ratio, the EBIT of the South African parent entity increases by 0.002686%.
d) For a USD1000 increase in ordinary dividends, the EBIT of the South African parent entity decreases by 0.0000137%.
e) For a one times increase in the stock turnover ratio, the EBIT of the South African parent entity decreases by 0.002405%.
f) For a USD1000 increase in total liabilities, the EBIT of the South African parent entity increases by 0.00000274%.
g) For a one times increase in the solvency ratio, the EBIT of the South African parent entity increases by 0.015357%

Based on the GLS with SUR results with rules from 2016 - 2017, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (1.630958.\tau) + (-0.308813) \qquad \text{Equation 6.8}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 11: GLS with SUR Estimation Results with rules from 2016-2017**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| -0.308813 | 1.630958 | 0.00% | -30.88% |
| -0.308813 | 1.630958 | 1.00% | -29.25% |
| -0.308813 | 1.630958 | 2.00% | -27.62% |
| -0.308813 | 1.630958 | 3.00% | -25.99% |
| -0.308813 | 1.630958 | 4.00% | -24.36% |
| -0.308813 | 1.630958 | 5.00% | -22.73% |
| -0.308813 | 1.630958 | 6.00% | -21.10% |
| -0.308813 | 1.630958 | 7.00% | -19.46% |
| -0.308813 | 1.630958 | 8.00% | -17.83% |
| -0.308813 | 1.630958 | 9.00% | -16.20% |
| -0.308813 | 1.630958 | 10.00% | -14.57% |
| -0.308813 | 1.630958 | 11.00% | -12.94% |
| -0.308813 | 1.630958 | 12.00% | -11.31% |
| -0.308813 | 1.630958 | 13.00% | -9.68% |
| -0.308813 | 1.630958 | 14.00% | -8.05% |
| -0.308813 | 1.630958 | 15.00% | -6.42% |
| -0.308813 | 1.630958 | 16.00% | -4.79% |
| -0.308813 | 1.630958 | 17.00% | -3.16% |
| -0.308813 | 1.630958 | 18.00% | -1.52% |
| -0.308813 | 1.630958 | 19.00% | 0.11% |
| -0.308813 | 1.630958 | 20.00% | 1.74% |
| -0.308813 | 1.630958 | 21.00% | 3.37% |
| -0.308813 | 1.630958 | 22.00% | 5.00% |

| | | | |
|---|---|---|---|
| -0.308813 | 1.630958 | 23.00% | 6.63% |
| -0.308813 | 1.630958 | 24.00% | 8.26% |
| -0.308813 | 1.630958 | 25.00% | 9.89% |
| -0.308813 | 1.630958 | 26.00% | 11.52% |
| -0.308813 | 1.630958 | 27.00% | 13.15% |
| -0.308813 | 1.630958 | 28.00% | 14.79% |
| -0.308813 | 1.630958 | 29.00% | 16.42% |
| -0.308813 | 1.630958 | 30.00% | 18.05% |
| -0.308813 | 1.630958 | 31.00% | 19.68% |
| -0.308813 | 1.630958 | 32.00% | 21.31% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 19% and 27% increased EBIT with the addition of transfer pricing rules. Therefore, a greater portion of the results were in line with the expectation after the implementation of the 2016 transfer pricing rules, compared with the implementation of the 2012 rules.

### 6.9.3. Transfer Pricing Rules 2017 only

The following table shows the estimation results of the transfer pricing rules 2017 only scenario.

**Table 12: Generalised Least Squares with Seemingly Unrelated Regression Results 2017 only (Author's compilation)**

| **Rules 2017 / Dependent Variable: LnEBIT** | | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std Error** | **t-Statistic** | **Probability** |
| Foreign Tax Rate | 1.185739 | 0.819946 | 1.446119 | 0.1533 |
| Rules 2017 | 1.065812 (***) | 0.400912 | 2.658467 | 0.0100 |
| Interaction Term: Rules 2017*Foreign Tax Rate | -2.893246 (*) | 1.686587 | -1.715444 | 0.0913 |
| Total Assets | -1.08E-06 (***) | 2.23E-07 | -4.828109 | 0.0000 |

| | | | | |
|---|---|---|---|---|
| Number of employees | -2.39E-05 (***) | 7.25E-06 | -3.300821 | 0.0016 |
| Interest cover ratio | 0.002974 (***) | 0.00074 | 4.017333 | 0.0002 |
| Ordinary Dividends | -1.27E-05 (***) | 1.79E-06 | -7.081125 | 0.0000 |
| Solvency ratio | 0.010286 (*) | 0.006174 | 1.666001 | 0.1008 |
| Stock turnover ratio | -0.002636 (***) | 0.000375 | -7.027477 | 0.0000 |
| Total liabilities | 2.40E-06 (***) | 4.54E-07 | 5.286672 | 0.0000 |
| Turnover | -6.97E-08 | 8.45E-08 | -0.825266 | 0.4124 |
| Constant | 10.20819 (***) | 0.328994 | 31.02855 | 0.0000 |
| **Weighted Stats** | | | | |
| R-squared | 0.934516 | Mean dependent var | 20.44262 | |
| Adjusted R-squared | 0.922708 | S.D. dependent var | 9.887777 | |
| S.E. of regression | 0.904712 | Sum squared resid | 49.92871 | |
| F-statistic | 79.1388 | Durbin-Watson stat | 2.03445 | |
| Prob (F-statistic) | 0.000000 | | | |
| **Unweighted Stats** | | | | |
| R-squared | 0.888868 | Mean dependent var | 11.3046 | |
| Sum squared resid | 23.76409 | Durbin-Watson stat | 1.261178 | |

Notes: (***), (**), (*) indicate one percent, five percent and ten percent level of significance, respectively.

The GLS with SUR estimates above indicate that ten out of twelve explanatory variables are significantly associated with the natural log of EBIT or percentage changes in EBIT, while two explanatory variables are statistically insignificant determinants of the natural log of EBIT. The rules dummy, total assets, number of employees, interest cover ratio, ordinary dividends, stock turnover ratio, total liabilities and the constant term are significant at the one percent level of significance. The interaction term and the solvency ratio are significant at the ten percent significance level. Although most of the control variables showed significance, the percentage change in EBIT is relatively small.

a) When transfer pricing rules are implemented in South Africa, the EBIT of the South African parent entity increases by 1.065812%.
b) When transfer pricing rules are implemented in South Africa, the EBIT of the South African parent entity decreases by 2.893246% times the foreign group tax rate. This means there is a 2.893246% decrease for every percentage increase in the foreign tax rate.
c) For a USD1000 increase in total assets, the EBIT of the South African parent entity decreases by 0.00000108%.
d) For every additional employee, the EBIT of the South African parent entity decreases by 0.0000239%.
e) For a one times increase in the interest cover ratio, the EBIT of the South African parent entity increases by 0.002974%.
f) For a USD1000 increase in ordinary dividends, the EBIT of the South African parent entity decreases by 0.0000127%.
g) For a one times increase in the stock turnover ratio, the EBIT of the South African parent entity decreases by 0.002636%.
h) For a USD1000 increase in total liabilities, the EBIT of the South African parent entity increases by 0.0000024%.
i) For a one times increase in the solvency ratio, the EBIT of the South African parent entity increases by 0.010286%.

Based on the GLS with SUR results with rules in 2017 only, the effect of transfer pricing rules on EBIT is as follows:

$$LnEBIT = (-2.893246.\tau) + (1.065812) \qquad \text{Equation 6.9}$$

The table below shows the effect on EBIT for each of the different foreign rates of taxation.

**Table 13: GLS with SUR Estimation Results with rules in 2017 only**

| Rules Coefficient | Interaction Coefficient | Foreign tax rate | Effect on EBIT |
|---|---|---|---|
| 1.065812 | -2.893246 | 0.00% | 106.58% |
| 1.065812 | -2.893246 | 1.00% | 103.69% |
| 1.065812 | -2.893246 | 2.00% | 100.79% |
| 1.065812 | -2.893246 | 3.00% | 97.90% |
| 1.065812 | -2.893246 | 4.00% | 95.01% |
| 1.065812 | -2.893246 | 5.00% | 92.11% |
| 1.065812 | -2.893246 | 6.00% | 89.22% |
| 1.065812 | -2.893246 | 7.00% | 86.33% |
| 1.065812 | -2.893246 | 8.00% | 83.44% |
| 1.065812 | -2.893246 | 9.00% | 80.54% |
| 1.065812 | -2.893246 | 10.00% | 77.65% |
| 1.065812 | -2.893246 | 11.00% | 74.76% |
| 1.065812 | -2.893246 | 12.00% | 71.86% |
| 1.065812 | -2.893246 | 13.00% | 68.97% |
| 1.065812 | -2.893246 | 14.00% | 66.08% |
| 1.065812 | -2.893246 | 15.00% | 63.18% |
| 1.065812 | -2.893246 | 16.00% | 60.29% |
| 1.065812 | -2.893246 | 17.00% | 57.40% |
| 1.065812 | -2.893246 | 18.00% | 54.50% |
| 1.065812 | -2.893246 | 19.00% | 51.61% |
| 1.065812 | -2.893246 | 20.00% | 48.72% |
| 1.065812 | -2.893246 | 21.00% | 45.82% |
| 1.065812 | -2.893246 | 22.00% | 42.93% |
| 1.065812 | -2.893246 | 23.00% | 40.04% |
| 1.065812 | -2.893246 | 24.00% | 37.14% |
| 1.065812 | -2.893246 | 25.00% | 34.25% |
| 1.065812 | -2.893246 | 26.00% | 31.36% |
| 1.065812 | -2.893246 | 27.00% | 28.46% |
| 1.065812 | -2.893246 | 28.00% | 25.57% |
| 1.065812 | -2.893246 | 29.00% | 22.68% |
| 1.065812 | -2.893246 | 30.00% | 19.78% |

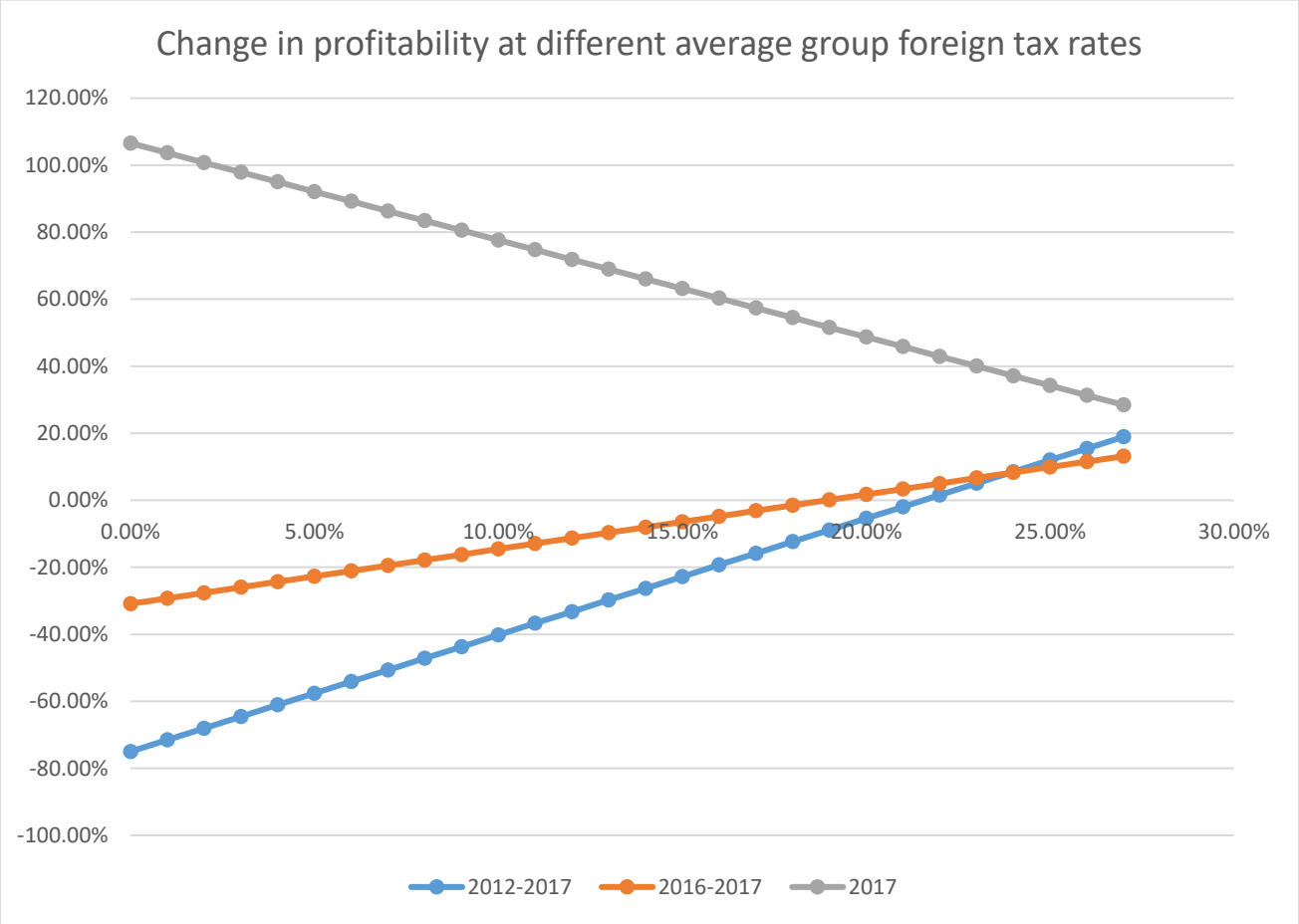
| | | | |
|---|---|---|---|
| 1.065812 | -2.893246 | 31.00% | 16.89% |
| 1.065812 | -2.893246 | 32.00% | 14.00% |

The portion highlighted in blue in the table above, shows which results are in line with the expectations. Namely, foreign tax rates between 0% and 27% increased EBIT with the addition of transfer pricing rules. This is in line with the expectation stated in section 6.4. Therefore, a greater portion of the results were in line with the expectation after the implementation of the 2017 transfer pricing rules, compared with the implementation of the 2016 rules. Furthermore, the coefficient of the rules dummy is positive, as expected.

### 6.9.4. Summary of standard GLS with SUR results

The following figure summarises the percentage changes in EBIT for each different average foreign tax rate in each of the three transfer pricing rules scenarios.

**Figure 7: Change in EBIT with the introduction of transfer pricing rules in all transfer pricing rules scenarios (GLS with SUR)**



The figure above shows that with each improvement or tightening of the transfer pricing rules 2012 versus 2016 versus 2017, more of the average group foreign tax rates begin to show an increase in South African EBIT. This can be interpreted as an indication that the tightening of transfer pricing rules leads to a reduction in profit shifting, based on the understanding that reduced profit shifting by South African MNEs would increase their South African profitability (i.e. increasing the amount of profits available to be taxed in South Africa).

Therefore, the results of the model using the GLS with SUR estimation technique were partially in line with the expectations set forth in section 6.4. above when the rules were less stringent (2012) and become increasingly more in line with the expectations as the rules become more stringent (2016) and are completely in line with the expectations when the rules are the most stringent (2017).

### 6.10. Review of the results

As the previous sections have shown, both estimation techniques showed similar trends, namely that the results of the estimation of the model became increasingly more in line with the expectations as the transfer pricing rules became more stringent. This is in indication that the introduction, and more specifically, the tightening, of transfer pricing rules can be successful in deterring profit shifting.

In the following section, the quality of the analysis is evaluated.

### 6.11. Evaluating the quality of a regression analysis

Studenmund (2011) explains that there a number of questions that should be asked in order to evaluate the regression results. Some examples include the following:

a) Is the equation supported by sound theory?
b) How well do the estimated coefficients correspond to the expectations developed by the researcher before the data was collected?
c) How well does the estimated regression fit the data?
d) Has the best estimator been used for the equation?

The first question is answered in chapters 1 through 5 of this text, while questions two through four are answered in the following sections.

### 6.11.1. Consideration of the expectations versus the results

The results of the model using the standard OLS and the GLS with SUR estimation technique were partially in line with the expectations set forth in section 6.4. above when the rules were less stringent (2012) and become increasingly more in line with the expectations as the rules become more stringent (2016) and are completely in line with the expectations when the rules are the most stringent (2017) i.e. in the third scenario there is a resultant increase in EBIT whenever the average foreign corporate tax rate is below 28% (i.e. $\beta 2(\tau_{it} \, . TP_{it}) + \beta 3TP_{it} > 0 \; when \; \tau < 28\%$).

Therefore, both the standard OLS and the GLS SUR results are in line with the expectations stated in section 6.4 above and are line with the baseline findings of Riedel et al. (2015) when the rules are the most stringent (2017) and somewhat in line with the expectations when the rules were less stringent (2012 and 2016).

In addition, the purpose of the model is to assess the relationship of the transfer pricing rules on profit shifting. Therefore, the significance of the transfer pricing rules and the interaction term variables should be considered. These variables are not found to be significant in any of the scenarios using OLS whereas these variables are found to be significant using GLS with SUR in the 2012-2017 and 2017 only transfer pricing rules scenarios. Therefore, the GLS with SUR provides more significant estimates than the OLS does under these scenarios.

### 6.11.2. Assessing the fit of the model

The “fit” of a regression refers to how well an estimated regression explains the variation of the dependent variable. Considering the fit of an estimated model is useful for evaluating the quality of a model and for comparing models (Studenmund, 2011). The R squared value measures the percent of variation in the dependent variable that can be accounted for or explained by the independent variables (Leamer, 1999).

The most simple and commonly used measure of fit is R squared ($R^2$). $R^2$ is the ratio of the explained sum of squares to the total sum of squares:

$$R^2 = \frac{ESS}{TSS} = 1 - \frac{RSS}{TSS} = 1 - \frac{\sum e_i^2}{\sum (Y_i - \bar{Y})^2} \qquad \text{Equation 6.10}$$

The higher the $R^2$ is, the closer the estimated regression equation fits the sample data. $R^2$ would fall within the following interval and a value close to one would represent an excellent overall fit and a value close to zero would represent a poor fit meaning that the estimated regression equation fails to explain the values of the dependent variable ($Y_i$) any better than the sample mean ($\bar{Y}$) would:

$$0 \leq R^2 \leq 1 \qquad \text{Equation 6.11}$$

In addition, the p-value of the entire regression can also be considered - a low value would imply that at least some of the regression parameters are not equal to zero and that the regression equation does have some validity in fitting the data (i.e., the independent variables are not purely random with respect to the dependent variable).

The following table provides the $R^2$ and the p-values of the regression in each dummy scenario and using the standard OLS and GLS with SUR techniques respectively.

**Table 14: R-Squared Results**

| | | R SQUARED | p-value |
|---|---|---|---|
| 2012 | OLS | 0.890745 | 0.000000 |
| | GLS | 0.922289 | 0.000000 |
| 2016 | OLS | 0.886974 | 0.000000 |
| | GLS | 0.914856 | 0.000000 |
| 2017 | OLS | 0.891366 | 0.000000 |
| | GLS | 0.934516 | 0.000000 |

Based in the table above, the p-values are the same in all instances, specifically the regression is significant at the one percent level in all dummy scenarios under both estimation techniques. This means the null-hypothesis can always be rejected and it can be concluded that both the standard OLS and the GLS with SUR provides a better fit than if there were no independent variables (i.e. if the intercept-only model were used).

The fact that the p-values are as low as they are means that we could not have obtained the results if the null hypothesis held true; therefore, there must be a relationship between the estimated variable(s) and the dependent variable in all cases. Therefore, when only the p-values are considered, neither technique provides a better fit or higher significance than the other.

However, when the R squared is considered it is clear that the SUR model always provides a better fit for the data as compared with the standard OLS as it is always higher for every dummy scenario.

The figures below depict the R squared for each of the estimation techniques in each of the dummy scenarios.

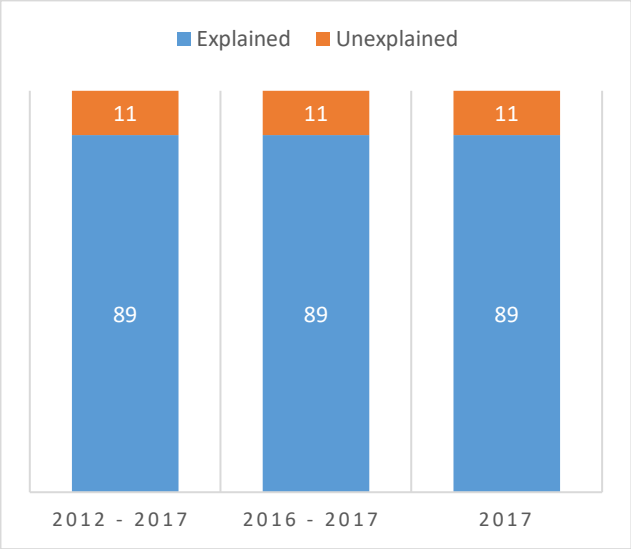



**Figure 8: Standard OLS R Squared Results**

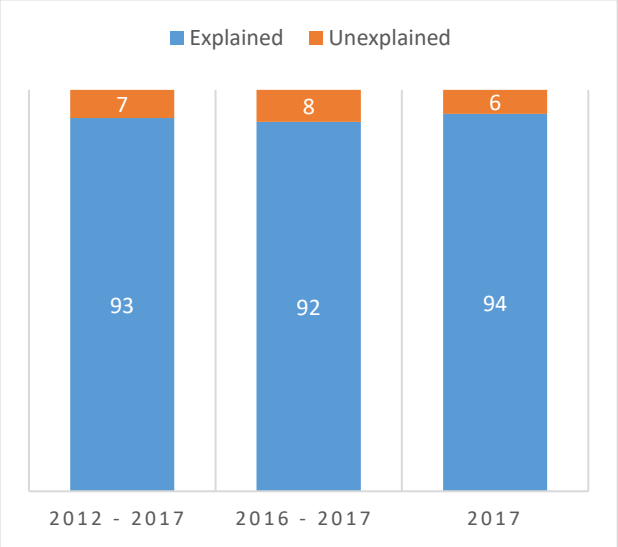



**Figure 9: Standard GLS with SUR R Squared Results**

Based on the value of the $R^2$, the standard OLS estimation technique leaves 11% of the variation in EBIT unexplained in each dummy scenario, whereas the SUR estimation technique leaves only 7%, 8% and 6% of the variation in EBIT unexplained in each of the dummy scenarios respectively.

Therefore, the SUR technique appears to provide an estimated regression equation with a superior fit compared with the standard OLS.

### 6.11.3. Decision on the most appropriate estimator

As explained in Chapter 5, SUR corrects for the suspected heteroscedasticity and general correlation of observations within a cross-section (Zellner, 1962). Correlation of the results was identified by the EViews programme and in addition it is noted that the panel may be correlated because the same set of firms are being observed over a period of time and the year on year results could be correlated. The results of the different firms may also be correlated due to similarities between their respective industries. In addition, some of the firm data collected may be related due to being listed or unlisted companies. All of the above may result in correlation of the error terms.

Since contemporaneous correlation is suspected, an estimator that succeeds in correcting for correlation would be preferred. In order to determine the level of first-order serial correlation that exists in the error term with each estimation, the Durbin-Watson statistic can be considered. The statistic examines the residuals of a particular estimation of an equation in order to determine whether there is first-order serial correlation in the error term (Studenmund, 2011). The Durbin-Watson statistic equals zero if there is extreme positive serial correlation, four if there is extreme negative serial correlation and two if there is no serial correlation (Studenmund, 2011). The Durbin-Watson statistic for each estimator under each dummy scenario is displayed in the table below.

**Table 15: Durbin-Watson statistics**

| | | Durbin-Watson Statistic | Distance from 2 |
|---|---|---|---|
| 2012 | OLS | 1.308469 | 0.691531 |
| | GLS | 2.084087 | -0.084087 |
| 2016 | OLS | 1.222691 | 0.777309 |
| | GLS | 1.959957 | 0.040043 |
| 2017 | OLS | 1.187739 | 0.812261 |
| | GLS | 2.03445 | -0.03445 |

Based on the table above, the GLS with SUR results always produce a Durbin-Watson statistic that is closer to two compared with the OLS results. In general, the GLS with SUR Durbin-Watson statistics are very close to two, which means that the GLS with

SUR effectively corrects for the suspected contemporaneous correlation. Therefore, the GLS with SUR provides better estimates than standard OLS does.

Therefore, the GLS with SUR technique is preferred as it corrects for contemporaneous correlation and as explained in the preceding sections, the GLS with SUR technique yields a better fit of the estimated regression as can be seen by the higher $R^2$.

Based on each of the techniques employed in estimating the model above and the analysis thereof, the GLS with SUR technique appears to be the most appropriate estimator of the regression analysis when utilising this particular dataset.

### 6.12. Conclusion

Based on the econometric analysis performed and empirical findings, it is shown that with each improvement or tightening of the transfer pricing rules 2012 versus 2016 versus 2017, more of the average group foreign tax rates begin to show an increase in South African EBIT. This can be interpreted as an indication that the tightening of transfer pricing rules leads to a reduction in profit shifting, based on the understanding that increases in South African profitability is an indication of reduced profit shifting by South African MNEs (i.e. by increasing the amount of profits available to be taxed in South Africa).

The results of the model using the OLS and using the GLS with SUR estimation technique were partially in line with the expectations set forth in section 6.4. above when the rules were less stringent (2012) and become increasingly more in line with the expectations as the rules become more stringent (2016) and are completely in line with the expectations when the rules are the most stringent (2017). However, it is determined that the GLS with SUR is the better estimator of the regression for the particular dataset.

The results are in line with the expectations of the analysis and with the previous findings of Riedel et al. (2015). However, whilst Riedel et al. (2015) selected a sample of European companies, which formed part of an MNE group, this study focussed on a sample of South African companies. As mentioned in Chapter 2, South Africa is considered to be a developing economy. Therefore, although it was expected, it was uncertain whether the results would follow the Riedel et al. (2015) findings. The reason for the uncertainty is due to the fact that transfer pricing regulations place a high administrative burden on tax authorities and tax authorities in developing countries are thought to lack the

administrative capacity required in order to properly enforce the regulations (Nhema, 2016). Furthermore the study performed by Wier (2018), found that transfer mispricing fell in the immediate aftermath of the previous change in South African transfer pricing regulations (2012 – 2014) but later (2015) returned to its initial level since companies' fear of higher audit risk led to the initial response of a reduction in transfer mispricing; but it then became clear that the tax authority (SARS) did not increase its administrative capabilities in order to ensure compliance; therefore, the effect of the reform disappeared.

Based on the sample selected and the analysis performed, it was found that the results follow the trend identified by Riedel et al. (2015) and profit shifting is reduced following the implementation of the regulations. Furthermore, the results follow a trend where the tightening of the rules leads to a further reduction in profit shifting. However, as mentioned above, in order for the regulations to continue to effectively deter profit shifting, focus needs to be placed on improving the administrative capabilities of the tax authorities in order to ensure they can successfully enforce the regulations going forward.

The following chapter summarises and concludes the study.

# CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

## 7.1. Introduction

This chapter concludes the study, presents the summary of empirical findings and provides areas of further research.

## 7.2. Summary of the study

The objective of this study was to investigate the factors that determine and deter profit shifting with the focus on transfer pricing. The study was motivated both by the harmful effects of profit shifting and importance of tax revenues to South Africa as a developing country.

The study pursued two specific objectives to empirically examine the determinants and deterrents of profit shifting. The first objective was to review the information available on profit shifting. The second objective was to examine the effect of legislative policy on profit shifting using a sample of South African MNEs.

The study tested three hypotheses:

a) That profit shifting is a real occurrence that can have harmful effects on a country by eroding its tax base, reducing tax revenues and thus impeding development due to a lack of resources.
b) That the utilisation of legislative measures through the adoption of transfer pricing regulations in South Africa will lead to a reduction in the occurrence of profit shifting by multinationals operating in the country under the assumption that all conditions are met: the political will to implement the tax system effectively, a clear strategy regarding how to implement the tax system, and adequate resources in order to complete the implementation.
c) That the tightening of the legislative measures would lead to further reductions in the occurrence of profit shifting by multinationals operating in the country under the assumption that all conditions are met: the political will to implement the tax system effectively, a clear strategy regarding how to implement the tax system, and adequate resources in order to complete the implementation.

The study begins with a background on the importance of CIT revenues in South Africa and the effect of profit shifting for South Africa. The study then went on to explore and

explain the concepts of globalisation and tax competition and also provides further details on how profit shifting affects an economy. A literature review was then presented, which explored the existing literature on the profit shifting phenomenon, its existence and impact on the world and the potential countermeasures, which could be employed in response to this phenomenon. Following that, further relevant statistics on CIT in the South African context and the relevant CIT and transfer pricing policies in South Africa were presented as well as the relevant studies performed in response to BEPS.

Following the extensive literature review, the research study was then presented, beginning with a description of the research methodology utilised in performing the research study, including descriptions of the data collected, the method of analysis and the assumptions and expectations of the study.

The empirical study utilised a simplified version of a developed empirical model, which is employed with a relevant South African dataset so as to consider the effect of legislative policy through the implementation of explicit and stringent transfer pricing rules on a sample of South African parented MNEs. The equation was estimated using both standard OLS and GLS with SUR techniques and the results and analysis thereof are presented in the preceding chapter. It is noted that the use of GLS with the SUR technique was determined to be more suitable to the dataset than the standard OLS.

Finally, the econometric analysis and the empirical findings were presented and analysed.

### 7.3. Summary of the empirical findings

Based on the econometric analysis performed and empirical findings, a sample of South African parented MNE groups showed increases in the percentages of EBIT reported following the introduction of transfer pricing rules. This is in line with the expectations of the analysis and with the previous findings of Riedel et al. (2015).

However, whilst Riedel et al. (2015) selected a sample of European companies, which formed part of an MNE group, this study focussed on a sample of South African companies. Since South Africa is considered to be a developing economy, it was uncertain whether the results would follow the Riedel et al. (2015) findings because of the high level of administrative capabilities required of the tax authority in order to enforce the regulations.

However, based on the sample selected and the analysis performed, it was found that the results follow the trend identified by Riedel et al. (2015) and the introduction of transfer pricing regulations reduced profit shifting in the sample of South African companies.

This research also provided an additional contribution compared with the Wier (2018) study because this study considers the impact of the tightening of transfer pricing rules in 2016 and 2017, in addition to the 2012 change, which Wier (2018) considers.

### 7.4. Recommendations

It is noted that the study performed by Wier (2018), found that transfer mispricing decreased immediately (2012 – 2014) after the 2012 change in transfer pricing legislation but in 2015 rose back to its initial level. Initially, taxpayers were concerned about the higher risk of being audited. However, after some time, it became apparent that SARS had not increased its administrative capabilities in order to actually conduct audits. Therefore, the effect of the 2012 reform disappeared.

However, over the past few years, SARS has significantly improved its capabilities in terms of the recruitment of skilled individuals and the creation of specialised teams to deal specifically with transfer pricing matters and transfer pricing audits. Therefore, there is a good chance that the effect of the 2016/2017 will not dissipate and the reform will continue to gain momentum as SARS continues to build its administrative resources and capabilities. However, it is essential that the South African government and other governments place focus on their ability to ensure the regulations are enforced if they want to ensure the regulations continue to be an effective deterrent in profit shifting away from their countries. One of the ways in which this is being addressed is through an initiative by the OECD and the African Tax Administration Forum (ATAF) to work together to improve tax systems in Africa. The parties signed a Memorandum of Co-operation in October 2012 and have since been conducting joint activities in order to obtain their objective (African Tax Adminstration Forum, 2012). However, it is noted that although steps have been taken to improve SARS' capabilities, the revenue authority is still experiencing certain inefficiencies and further improvement is required (National Treasury, 2019). According to the DTC (2016), it is important for SARS to continue building its administrative capacity by recruiting and maintaining high quality staff. Furthermore,

taxpayers need assurance that the taxes collected are being spent prudently and invested so as to provide benefits for the country.

In addition to noting the importance of administrative capabilities in deterring profit shifting, the DTC (2016) also noted that in order to ensure comprehensive protection against BEPS in South Africa, policy makers must also consider the development and communication of clear policies on tax incentives and treaty negotiations.

Since this study was performed very close to the beginning of the current reform, future research could be conducted on a similar sample after several years in order to determine whether the regulations continue to have the same effect on profit shifting in the future.

In addition, the study focussed on a relatively small South African sample due the limited information available at the time of conducting the research. As noted, there is an overall shortage of reliable data for independent companies operating in emerging or developing economies. Therefore, future research could be performed using a larger sample. However, this would depend on the availability of financial information in this regard.

Finally, the rules themselves also need to be considered on an ongoing basis in line with the principles of an effective tax system, namely, equity, efficiency, certainty and simplicity. Care should be taken by the revenue authority and policy makers to ensure that the rules are effective in curbing profit shifting but are not overly complex or burdensome on the taxpayer. The DTC released a series of final reports in April 2018 where the committee noted that tax legislation may be becoming too onerous and compliance and reporting requirements too burdensome and expensive to comply with. It is further noted that the main purpose of the South African tax system is to collect revenue and the tax system alone cannot address all the impairments to economic growth and social growth – further levels of involvement from government are required in this regard. However, future research could consider to what extent the tax system is able to influence behavioural changes that contribute to economic and social development (Davis Tax Committee, 2018).

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